Vol. 1015 Number 1

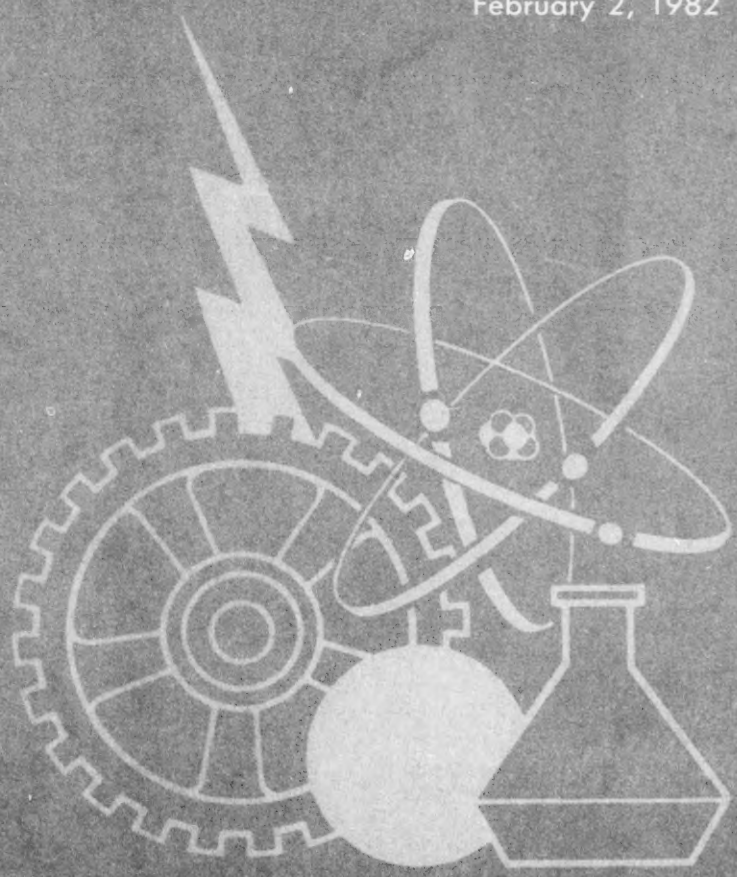
# OFFICIAL GAZETTE

of the

## UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

February 2, 1982



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# OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

February 2, 1982 Volume 1015 Number 1


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# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

| | |
|---|---|
| Transmittal fee | $ 35.00 |
| Search fee | 300.00 |
| International Basic Fee (for the first 30 sheets of an international application) | 215.00 |
| Basic Supplemental Fee (for each sheet over 30) | 4.00 |
| International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought) | 50.00 |

RENE D. TEGTMEYER,
*Assistant Commissioner for Patents.*

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### Board of Appeals Decisions Rendered in the Month of Dec. 1981

| | |
|---|---|
| Affirmed | 166 |
| Affirmed in Part | 24 |
| Reversed | 70 |
| Total | 260 |

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### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**3,529,406,** Re. S.N. 229,101, Filed Jan. 28, 1981, Cl. 55/500, FILTER FRAME SEAL, Adrian R. Allan, Jr., et al., Owner of Record: *Flanders Filter, Inc., Washington, N.C.,* Attorney or Agent: Donald M. Seltzer, Ex. Gp.: 177

**3,672,947,** Re. S.N. 320,382, Filed Nov. 12, 1981, Cl. 427/177, METHOD FOR TEXTURIZING YARNS, Paul Luscher, et al., Owner of Record: *PPG Industries, Inc., Pittsburgh, Pa.,* Attorney or Agent: John E. Curley, et al., Ex. Gp.: 162

**3,730,137,** Re. S.N. 320,381, Filed Nov. 12, 1981, Cl. 118/325, APPARATUS FOR COATING AND IMPREGNATING TEXTURIZED YARN, Paul Luscher, et al., Owner of Record: *PPG Industries, Inc., Pittsburgh, Pa.,* Attorney or Agent: John E. Curley, et al., Ex. Gp.: 162

**3,816,794,** Re. S.N. 312,808, Filed Oct. 19, 1981, Cl. 315/194, HIGH INTENSITY, GAS DISCHARGE LAMP DIMMER SYSTEM, Carl R. Snyder, Owner of Record: *Esquire, Inc., San Marcos, Tex.,* Attorney or Agent: Frank S. Vaden, III, et al., Ex. Gp.: 256

**3,880,783,** Re. S.N. 303,999, Filed Sept. 21, 1981, Cl. 260/3, TRANSPARENT MOULDING COMPOSITION OF A POLYCARBONATE AND A RESIN, Volker Serini, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Arthur G. Connolly, et al., Ex. Gp.: 142

**3,969,496,** Re. S.N. 311,408, Filed Oct. 14, 1981, Cl. 435/35, USE OF RADIOISOTOPES FOR RAPID IDENTIFICATION OF MICROORGANISMS, Joseph R. Schrot, Owner of Record: *Biospherics, Inc., Rockville, Md.,* Attorney or Agent: D. C. Roylance, et al., Ex. Gp.: 176

**4,001,905,** Re. S.N. 284,200, Filed July 17, 1981, Cl. 9/11, STABILIZED SURVIVAL RAFT, James A. Givens, Owner of Record: *Inventor,* Attorney or Agent: George M. Cole, et al., Ex. Gp.: 315

**4,057,636,** Re. S.N. 314,023, Filed Oct. 22, 1981, Cl. 424/263, ANTIHYPERTENSIVE PYRIDYLGUANIDINE COMPOUNDS, Hans Jorgen Petersen, Owner of Record: *Leo Pharmaceutical Products Ltd., Ballerup, Denmark,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 125

**4,148,976,** Re. S.N. 301,367, Filed Sept. 11, 1981, Cl. 429/191, SOLID STATE LITHIUM-IODINE PRIMARY BATTERY, Satoshi Sekido, et al., Owner of Record: *Matsushita Electric Industrial Co., Ltd., Osaka, Japan,* Attorney or Agent: Joseph W. Farley, Ex. Gp.: 111

**4,164,525,** Re. S.N. 292,768, Filed Aug. 14, 1981, Cl. 261/41B, DEVICE FOR SUPPLYING FUEL TO AN INTERNAL COMBUSTION ENGINE, Gunther Bernecker, Owner of Record: *G. M. C. Research, Inc., Orange, N.J.,* Attorney or Agent: C. Bruce Hamburg, et al., Ex. Gp.: 177

**4,191,376,** Re. S.N. 277,350, Filed June 25, 1981, Cl. 273/139, HIGHLY SECURE PLAYING CARDS FOR INSTANT LOTTERY AND GAMES, Max Goldman, et al., Owner of Record: *Systems Operations, Inc., Princeton, N.J.,* Attorney or Agent: Stanton T. Lawrence, et al., Ex. Gp.: 334

**4,196,821,** Re. S.N. 319,687, Filed Nov. 9, 1981, Cl. 220/94R, INSTRUMENT HOUSING, Joseph A. Teti, Jr., et al., Owner of Record: *LaFrance Precision Casting Co., Philadelphia, Pa.,* Attorney or Agent: Harold Pezzner, Ex. Gp.: 241

**4,205,252,** Re. S.N. 311,155, Filed Oct. 13, 1981, Cl. 313/422, FLAT CATHODE RAY TUBE WITH REPELLER ELECTRODE, Clive M. Sinclair, et al., Owner of Record: *National Research Development Corp., London, England,* Attorney or Agent: Lawrence E. Laubscher, Sr., et al., Ex. Gp.: 256

**4,232,746,** Re. S.N. 320,529, Filed Nov. 12, 1981, Cl. 172/59, SOIL CULTIVATING IMPLEMENTS, Cornelis van der Lely, Owner of Record: *Inventor,* Attorney or Agent: Penrose Lucas Albright, et al., Ex. Gp.: 334

**4,237,928,** Re. S.N. 305,786, Filed Sept. 25, 1981, Cl. 137/590, LOW PROFILE TAPERED SUMP FOR RAILWAY TANK CARS, Robert C. Messersmith, Owner of Record: *ACF Industries, Inc., New York, N.Y.* Attorney or Agent: Henry W. Cummings, Ex. Gp.: 341

**4,246,025,** Re. S.N. 319,728, Filed Nov. 9, 1981, Cl. 75/37, BENEFICIATION PROCESS FOR OXIDIZED IRON ORE, Edward F. Bertram, et al., Owner of Record: *Alberta Research Council, Edmonton, Alberta, Canada,* Attorney or Agent: Ernest Peter Johnson, Ex. Gp.: 111

**4,258,726,** Re. S.N. 296,618, Filed Aug. 27, 1981, Cl. 130/27L, ADJUSTABLE GUIDE VANES FOR AN AXIAL FLOW ROTARY SEPARATOR, Fritz Glaser, et al., Owner of Record: *Deere & Co., Moline, Ill.,* Attorney or Agent: H. Vincent Harsha, et al., Ex. Gp.: 333

**4,262,278,** Re. S.N. 267,094, Filed May 26, 1981, Cl. 340/52.3, DIAGNOSTIC BRAKE SYSTEM WARNING CIRCUIT, Donald W. Howard, et al., Owner of Record: *The Bendix Corp., Southfield, Mich.*, Attorney or Agent: None, Ex. Gp.: 234

**4,273,821,** Re. S.N. 317,699, Filed Nov. 2, 1981, Cl. 428/215, FIRE PROTECTIVE TAPE, J. Watson Pedlow, et al., Owner of Record: *Inventors,* Attorney or Agent: Robert M. Rodrick, et al., Ex. Gp.: 164

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### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

**3,560,287,** Reexam. No. 90/000,130, Requested: Dec. 24, 1981, Cl. 156/218, METHOD AND APPARATUS FOR PROTECTING INSULATED PIPE, Robert W. Helling, Owner of Record: *Ceel-Co., Inc., Lakewood, Colo.*, Attorney or Agent: Fields, Lewis, et al., Ex. Gp.: 160, Requester: Ceel-Co., Inc., Lakewood, Colo.

**3,952,776,** Reexam. No. 90/000,131, Requested: Dec. 23, 1981, Cl. 138/39, FLUID FLOW DEVICE, James F. Eversole, et al., Owner of Record: *Dresser Ind., Inc., Dallas, Tex.*, Attorney or Agent: Richard M. Beck, Ex. Gp.: 240, Requester: Ford Motor Co., Dearborn, Mich.

**4,016,031,** Reexam. No. 90/000,128, Requested: Dec. 21, 1981, Cl. 162/313, MANUFACTURE OF COMPOSITE MATERIALS, Greville E. G. Bagg, et al., Owner of Record: *National Research Development Corp., London, England,* Attorney or Agent: Cushman, Darby, et al., Ex. Gp.: 170, Requester: Ciba-Geigy Corp., Ardsley, N.Y.

**4,231,383,** Reexam. No. 90/000,132, Requested: Dec. 23, 1981, Cl. 137/1, MASS FLOW RATE, James F. Eversole, et al., Owner of Record: *Dresser Industries, Inc., Dallas, Tex.*, Attorney or Agent: Richard M. Beck, Ex. Gp.: 341, Requester: Ford Motor Co., Dearborn, Mich.

**4,240,184,** Reexam. No. 90/000,134, Requested: Dec. 23, 1981, Cl. 24/279, PIPE AND CABLE CLAMPS, John P. Conlan, et al., Owner of Record: *BICC Ltd., London, England,* Attorney or Agent: Eugene F. Buell, et al., Ex. Gp.: 355, Requester: Buell, Blenko, et al., Pittsburgh, Pa.

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### National Inventors Day

The Patent and Trademark Office and the National Council of Patent Law Associations will sponsor National Inventors Day in the Public Search Room on Saturday, Feb. 6, 1982, from 1:00 p.m. to 5:00 p.m. and Sunday, Feb. 7, 1982, from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend the ceremony at 2:00 p.m. on Sunday, Feb. 7, 1982, during which time a number of inventors will be inducted into the National Inventors Hall of Fame.

In Order to assemble the exhibits it will be necessary to close the Search Room on Friday, Feb. 5, 1982, at 5:00 p.m. The removal of all personal property from the Search Room by the early closing time would be appreciated.

GERALD J. MOSSINGHOFF,
*Commissioner of Patents and Trademarks.*

Jan. 5, 1982.

### Government-Owned Inventions

*Notice of Availability for Licensing*

The inventions listed below are owned by agencies of the U.S. government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce

SN 6-294,096, Enhancement of Color Quality of Lumber During Drying. Filed Sept. 18, 1981 by the Dept. of Agriculture. Inventor: Howard Rosen.

SN 6-302,008, Process for Modifying Cellulosic Fabrics for Improved Heat Transfer Printing. Filed Sept. 15, 1981 by the Dept. of Agriculture. Inventor: Eugene Blanchard.

SN 6-272,842, Zwitterion Compounds as Catalysts in Easy-Care Finishing. Filed by Dept. of Agriculture on June 12, 1981. Inventor: Robert M. Reinhardt.

SN 6-276,768, Bromine-Containing 2,4-Diaminotriazines. Filed June 24, 1981 by the Dept. of Agriculture. Inventor: Leon H. Chance.

SN 6-294,095, New Surface in Cellulosic Fibers by Use of Radiofrequency Plasma of Ammonia. Filed Aug. 19, 1981 by the Dept. of Agriculture. Inventor: Truman L. Ward.

SN 6-290,540, Method for Sampling Flying Insect Populations Using Low-Frequency Sound Detecting & Ranging in Conjunction with a Biologically Active Chemical/Pheromone. Filed Aug. 6, 1981 by the Dept. of Agriculture. Inventor: D. E. Hendricks.

SN 6-308,350, Antimicrobial Glycolic Acid Derivatives. Filed Oct. 5, 1981 by the Dept. of Agriculture. Inventor: August V. Bailey.

SN 6-311,587, Apparatus for Continuous Injection of Chemically-Impregnated Filament. Filed Oct. 15, 1981 by the Dept. of Agriculture. Inventor: Jim E. Dale.

SN 6-308,743, Antimicrobial Glycolic Acid Derivatives. Filed by the Dept. of Agriculture on Oct. 5, 1981. Inventor: August V. Bailey.

SN 6-311,702, Apparatus to Extract Dust and Fine Trash from Opened Cotton. Filed Oct. 15, 1981 by the Dept. of Agriculture. Inventor: Charles Shepard.

SN 6-302,007, Textile Finishing Agents from Reaction Products of Carbamates and Glutaraldehyde. Filed Sept. 15, 1981 by the Dept. of Agriculture. Inventor: John G. Frick.

SN 6-294,203, Nondenaturing Zwitterionic Detergents for Membrane Biochemistry. Filed Aug. 26, 1980 by the Dept. of Health and Human Services. Inventor: Leonard Hjelmeland.

SN 6-180,373, Nitroimidazoles of Low Toxicity and High Activity as Radiosensitizers of Hypoxic Tumor Cells. Filed Aug. 2, 1980 by the Dept. of Health & Human Services. Inventor: W. W. Lee.

### Trademark Errata

In the Official Gazette of September 19, 1978 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 287, "920,181. ANDREA. U.S. Cls. 29, 37, 40, 51, and 52. 9-14-71." should be deleted.

In the Official Gazette of December 9, 1980 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 93, "986,558. STARLINE. U.S. Cl. 46. 6-18-74" should be deleted.

In the Official Gazette of December 16, 1980 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 127, "986,786. GE. U.S. Cl. 16. 6-25-74" should be deleted.

In the Official Gazette of December 9, 1980 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 93, "1,010,668. U.S. HOME AND DESIGN. U.S. Cls. 16 and 100. 5-13-75" should be deleted.

In the Official Gazette of June 2, 1981 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 147, "1,001,070. DECORLIN. INT. 24. 1-7-75" should be deleted.

In the Official Gazette of June 2, 1981 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 148, "1,001,142. CHEMSAVE. INT. 36. 1-7-75" should be deleted.

In the Official Gazette of June 9, 1981 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 298, "1,001,394. HAIPEN. INT. Cl. 2. 1-4-75" should be deleted.

In the Official Gazette of June 30, 1981 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 763, "1,003,778. NUTRI-BACT. U.S. Cl. 6. 2-4-75" should be deleted.

# PATENT NOTICES

**Certificates of Correction for the Week of Feb. 2, 1982**

| | | | |
|---|---|---|---|
| Re. 30,420 | 4,266,082 | 4,284,241 | 4,294,484 |
| D. 259,254 | 4,267,296 | 4,284,634 | 4,294,810 |
| D. 259,786 | 4,269,971 | 4,284,635 | 4,294,876 |
| 3,665,287 | 4,272,987 | 4,284,964 | 4,295,322 |
| 3,752,955 | 4,273,063 | 4,285,046 | 4,295,495 |
| 4,140,758 | 4,273,687 | 4,285,256 | 4,296,034 |
| 4,169,809 | 4,273,857 | 4,285,263 | 4,296,389 |
| 4,182,915 | 4,273,921 | 4,285,304 | 4,296,421 |
| 4,183,599 | 4,274,087 | 4,286,288 | 4,296,505 |
| 4,183,933 | 4,274,203 | 4,286,992 | 4,296,570 |
| 4,184,790 | 4,274,578 | 4,287,061 | 4,296,891 |
| 4,185,959 | 4,275,193 | 4,287,460 | 4,296,996 |
| 4,194,815 | 4,275,469 | 4,287,790 | 4,297,380 |
| 4,213,628 | 4,276,052 | 4,287,980 | 4,297,503 |
| 4,214,314 | 4,276,267 | 4,288,181 | 4,297,652 |
| 4,220,708 | 4,277,603 | 4,288,310 | 4,297,905 |
| 4,222,396 | 4,277,735 | 4,289,432 | 4,298,015 |
| 4,222,856 | 4,277,902 | 4,289,554 | 4,298,025 |
| 4,227,803 | 4,278,319 | 4,289,730 | 4,298,198 |
| 4,229,443 | 4,278,403 | 4,289,945 | 4,298,274 |
| 4,234,569 | 4,278,533 | 4,290,989 | 4,298,288 |
| 4,236,829 | 4,278,784 | 4,291,185 | 4,298,529 |
| 4,239,505 | 4,278,852 | 4,291,187 | 4,298,790 |
| 4,241,035 | 4,278,977 | 4,291,261 | 4,299,814 |
| 4,241,783 | 4,279,589 | 4,291,269 | 4,300,119 |
| 4,242,276 | 4,280,160 | 4,291,350 | 4,300,129 |
| 4,242,305 | 4,280,716 | 4,292,476 | 4,300,370 |
| 4,243,100 | 4,280,982 | 4,292,667 | 4,300,406 |
| 4,244,095 | 4,281,113 | 4,292,813 | 4,300,434 |
| 4,247,694 | 4,281,180 | 4,292,874 | 4,300,820 |
| 4,249,558 | 4,281,564 | 4,292,966 | 4,301,131 |
| 4,254,475 | 4,282,855 | 4,293,219 | 4,301,138 |
| 4,255,441 | 4,283,540 | 4,293,463 | 4,303,137 |
| 4,256,231 | 4,284,032 | 4,293,678 | 4,303,580 |

**Disclaimer**

4,028,319.—*David A. Jones, Jr.,* Evanston; *James M. Schlatter,* Glenview; *Richard A. Mikulec,* Chicago; *Judith A. Reuter, Skokie,* and *Robert H. Mazur,* Deerfield, Ill. 2 and 3-SUBSTITUTED ENKEPHALINS. Patent dated June 7, 1977. Disclaimer filed Nov. 30, 1981, by the assignee, *G. D. Searle & Co.*

Hereby enters this disclaimer to claims 1-3, 8 and 9 of said patent.

4,050,311.—*John Meredith Leach,* Port Jefferson-Belle Terre, N.Y. SPHYGMOMANOMETER. Patent dated Sept. 27, 1977. Disclaimer filed Nov. 23, 1981, by the inventor.

Hereby enters this disclaimer to claims 1, 2 and 9 of said patent.

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**Dedication**

3,692,673.—*Donald Irvin Hoke,* Chagrin Falls, Ohio. WATER-SOLUBLE SULFONATE POLYMERS AS FLOCCULANTS. Patent dated Sept. 19, 1972. Dedication filed Sept. 10, 1981, by the assignee, *The Lubrizol Corp.*

Hereby dedicates to the Public the entire remaining term of said patent.

## Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

| *State* | *Name of Library* | *Telephone Contact* |
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| Alabama | Birmingham Public Library | (205) 254-2555 |
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| California | Los Angeles Public Library | (213) 626-7555 Ext. 273 |
| | Sacramento: California State Library | (916) 322-4572 |
| | Sunnyvale: Patent Information Clearinghouse* | (408) 738-5580 |
| Colorado | Denver Public Library | (303) 573-5152 Ext. 222 |
| Delaware | Newark: University of Delaware | (302) 738-2238 |
| Georgia | Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology | (404) 894-4519 |
| Illinois | Chicago Public Library | (312) 269-2814 |
| Louisiana | Baton Rouge: Troy H. Middleton Library, Louisiana State University | (504) 388-2570 |
| Massachusetts | Boston Public Library | (617) 536-5400 Ext. 265 |
| Michigan | Detroit Public Library | (313) 833-1450 |
| Minnesota | Minneapolis Public Library & Information Center | (612) 372-6552 |
| Missouri | Kansas City: Linda Hall Library | (816) 363-4600 |
| | St. Louis Public Library | (314) 241-2288 Ext. 214, 215 |
| Nebraska | Lincoln: University of Nebraska-Lincoln, Engineering Library | (402) 472-3411 |
| New Hampshire | Durham: University of New Hampshire Library | (603) 862-1777 |
| New Jersey | Newark Public Library | (201) 733-7814 |
| New York | Albany: New York State Library | (518) 474-5125 |
| | Buffalo and Erie County Public Library | (716) 856-7525 Ext. 267 |
| | New York Public Library (The Research Libraries) | (212) 930-0850 |
| North Carolina | Raleigh: D. H. Hill Library, N.C. State University | (919) 737-3280 |
| Ohio | Cincinnati & Hamilton County, Public Library of | (513) 369-6936 |
| | Cleveland Public Library | (216) 623-2870 |
| | Columbus: Ohio State University Libraries | (614) 422-6286 |
| | Toledo/Lucas County Public Library | (419) 255-7055 Ext. 212 |
| Oklahoma | Stillwater: Oklahoma State University Library | (405) 624-6546 |
| Pennsylvania | Philadelphia: Franklin Institute Library | (215) 448-1321** |
| | Pittsburgh: Carnegie Library of Pittsburgh | (412) 622-3138 |
| | University Park: Pattee Library, Pennsylvania State University | (814) 865-4861 |
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| | Houston: The Fondren Library, Rice University | (713) 527-8101 Ext. 2587 |
| Washington | Seattle: Engineering Library, University of Washington | (206) 543-0740 |
| Wisconsin | Madison: Kurt F. Wendt Engineering Library, University of Wisconsin | (608) 262-6845 |
| | Milwaukee Public Library | (414) 278-3043 |

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

# PATENT EXAMINING CORPS

**RENE D. TEGTMEYER, Assistant Commissioner**

**WILLIAM FELDMAN, Deputy Assistant Commissioner**

**CONDITION OF PATENT APPLICATIONS AS OF December 26, 1981**

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 6-23-80 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 12-06-79 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions. | 3-02-81 |
| COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography. | 11-14-80 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 10-06-80 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales. | 5-20-80 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries. | 6-19-80 |
| INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 8-07-80 |
| RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling. | 12-07-79 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 10-02-79 |
| DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts. | 4-02-80 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment. | 7-01-80 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter. | 6-17-80 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination. | 3-17-80 |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication. | 10-22-79 |
| GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches. | 3-17-80 |

**Expiration of patents**: The patents within the range of numbers indicated below expire during December 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

**Patents** ..... Numbers 3,158,867 to 3,163,864, inclusive

**Plant Patents** ..... Numbers 2,455 to 2,464 inclusive

PATENT EXAMINING CORPS
RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FRIDMAN, Deputy Assistant Commissioner
CHRONOLOGY OF PATENT APPLICATIONS AS OF December 30, 1981

# DEFENSIVE PUBLICATIONS

## PUBLISHED FEBRUARY 2, 1982

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

### T101,501
### LIGHT-WEIGHT BASE FOR A BED

**James D. Robinson, 3 The Jinnings, Welwyn Garden City, Hertfordshire, England**

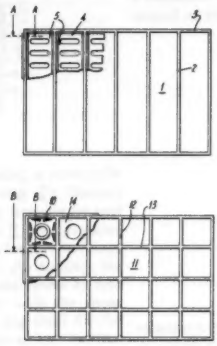
**Filed Mar. 5, 1980, Ser. No. 127,303**

**Claims priority, application United Kingdom, Dec. 21, 1979, 44209/79**

**Int. Cl.³ A47C *19/02***

**U.S. Cl. 5—186 R**

**4 Sheets Drawing. 8 Pages Specification**



A light-weight base for a bed is described which includes a mattress-supporting platform (4) supported on a frame (1) of opposed ribs (2) in which the platform (4) is formed from an array of resiliently depressible crested thermoplastics bridges (5) which act as springs and which extend between pairs of opposed ribs (2) and their crests rise above the tops of ribs (2). Bridges (5) may be conveniently injection molded from crystalline polypropylene or propylene/ethylene copolymer in sections 0.5 to 5 mm thick and are preferably integral with fixing means (6) which make push fits into ribs (2). The polypropylene bridges have good resistance to flexing fatigue, are light-weight and, when provided with integral fixing means, are easily assembled on frame (1). These modified bases may be used as seat or back portions of chairs as well.

# DEFENSIVE PUBLICATIONS

PUBLISHED FEBRUARY 7, 1963

Pursuant to the terms of the applicable rules in accordance with the Order, 37 CFR 1.99, 867 TO, the publication of Defensive Publications and Statutory Invention Registrations will be published, unless otherwise ordered, consecutively. The Defensive Notice is affixed indicating the manner of proper of specification, drawing, and abstract of pending, contained in the publication as originally filed. The filing of these applications are available to the public for inspection and copying as provided in 37 CFR 1.14(b) and (c).

Defensive Publication applications may not have remained in or for pending of abject invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

THE SEA

LIGHT-WEIGHT EASY PEEL & SEAL
James D. Robinson, 3 The Grove, Ruislip in Greater London, Eng.
Filed Nov. 8, 1960, Ser. No. 72,060
Claims priority, application United Kingdom, Dec. 31, 1959

Int. Cl. B65C 5/02
U.S. Cl. 5—339

4 Sheets Drawing. 1 Page Specification

# REISSUES

## FEBRUARY 2, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

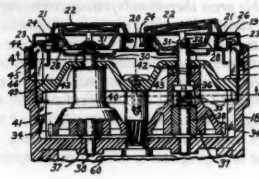
### Re. 30,857
### ROTARY DRY SHAVER WITH TILTABLE SHEAR PLATES

**Tracy B. Tyler, Miami Beach, Fla., assignor to Edwin E. Greigg, Silver Spring, Md., a part interest**

**Original No. 3,715,803, dated Feb. 13, 1973, Ser. No. 115,546, Feb. 16, 1971. Continuation of Ser. No. 528,499, Nov. 29, 1974, abandoned. Application for reissue Jun. 11, 1976, Ser. No. 695,020**

**Int. Cl.³ B26B *19/16***

**U.S. Cl. 30—43.5** **12 Claims**



1. In a rotary dry shaver, a component housing, a *universally* tiltable *nonrotating* cutting element comprising [a flanged apertured shear plate exposedly retained in the housing by said flange positioned under an apertured frame,] *an apertured shear plate provided with a radially extended flange, the flange positioned under an apertured frame affixed to the housing, the cutting element exposedly retained by and in said frame by said flange,* a rotary cutting member cooperative with the shear plate and coactively tiltable therewith, a driving shaft for the cutting member, means to bias the cutting member into contact with the shear plate, and the said cutting element [tiltably supported axially by means separate from the cutting member and its biasing means] *supported in the axial direction and universally tiltable on a single supporting element separate from the cutting member and its biasing means and the means tiltably connecting the driving shaft to the cutting member.*

*7. In a dry shaver including a housing, at least one cutter guard and a cooperating cutter that is rotatable about its axis, a holder in which said guard is movably mounted, the first spring means for resiliently urging said cutter axially upward (when said shaver is upright) into engagement with said guard which is thereby urged upward in engagement with said mount, the improvement in combination therewith wherein said holder includes a circular aperture defined by a rim having first diameter, said guard has an outer surface which is spherically curved, has diameter corresponding to said first diameter, and is situated within and engaging said rim, said spherical surface having its center situated substantially on said cutter axis, said guard and cutter together being both pivotable in said rim and depressible axially downward against said first spring means.*

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### Re. 30,858
### IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

**Eric H. Ford, London, England, assignor to Lumenition Limited, London, England**

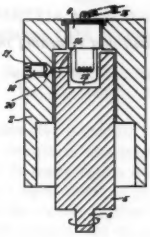
**Original No. 3,605,712, dated Sep. 20, 1971, Ser. No. 801,721, Feb. 24, 1969. Application for reissue Sep. 27, 1978, Ser. No. 946,435**

**Claims priority, application United Kingdom, Feb. 29, 1968, 946/68; Oct. 22, 1968, 50102/68; Nov. 19, 1968, 54775/68**

**Int. Cl.³ F02P *1/00*; F02D *5/04***

**U.S. Cl. 123—651** **10 Claims**

1. A device for providing rapid switching of the primary circuit of an ignition coil of an internal combustion engine to thereby induce a desired voltage in the secondary circuit *of the ignition coil, said device* comprising a photo-transistor sensitive to infra-red radiation which will switch on or conduct when exposed to the radiation and switch off when the radiation is cut off; a gallium arsenide lamp emitting infra-red radiation; an element which is opaque to infra-red radiation positioned between the gallium arsenide lamp and the photo-transistor, said opaque element having as many equi-spaced apertures therein as there are cylinders in the engine; means for moving the opaque element in timed relation to the engine revolutions; [an amplifier having first and second transistors connected in cascade to the output of the photo-transistor and arranged to switch in inverse relation to one another so that at any one time a transistor is always conducting; and a power transistor connected to the output of the amplifier to be switched in inverse



relation to the second transistor of the amplifier and connected in circuit relationship with the ignition coil such that each time a beam of infra-red radiation is cut off from said photo-transistor, the transistorized amplifier circuit causes] *and a switching circuit interconnecting the photo-transistor with the ignition coil and including a first transistor connected to the output of the photo-transistor, a second transistor, and a power transistor connected to the primary circuit of the ignition coil, the first, second and power transistors being interconnected in a manner such that adjacent ones switch on and off in inverse relation to one another and such that at least one is conducting at any one time, whereby the switching circuit, in response to each time a beam of infra-red radiation is cut off from the photo-transistor causes* rapid switching of the primary circuit and a resultant production of the desired voltage in [said] *the* secondary circuit.

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### Re. 30,859
### BOWLING PRACTICE DEVICE

**Leslie E. Harvey, 954 Henderson Ave., and Stephan D. Spiva, 1247 Balboa Ct., both of Sunnyvale, Calif. 94086**

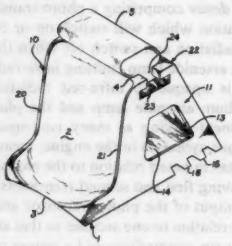
**Original No. 4,046,376, dated Sep. 6, 1977, Ser. No. 698,952, Jun. 23, 1976. Application for reissue Sep. 4, 1979, Ser. No. 72,335**

**Int. Cl.³ A63D *5/00***

**U.S. Cl. 273—54 D** **17 Claims**

*9. A bowling practice device comprising means for receiving a rolling bowling ball, said receiving means comprising means having parallel edges for centering said rolling bowling ball with*

*respect to the longitudinal axis of said receiving means and means forming an upwardly inclined curved surface for reducing the forward velocity of the ball and returning the ball to the roller thereof.*



**Re. 30,860**

## PROCESS FOR TREATING CELLULOSIC MATERIAL WITH FORMALDEHYDE IN LIQUID PHASE AND SULFUR DIOXIDE

**Ronald Swidler, Palo Alto, and Katherine W. Wilson, San Diego, both of Calif., assignors to Cotton, Incorporated, New York, N.Y.**

**Original No. 3,841,832, dated Oct. 15, 1974, Ser. No. 332,332, Feb. 14, 1973. Continuation-in-part of Ser. No. 237,056, Mar. 22, 1972, abandoned, and Ser. No. 706,792, Feb. 20, 1968, abandoned, each is a continuation-in-part of Ser. No. 239,361, Mar. 29, 1972, abandoned. Application for reissue Mar. 2, 1976, Ser. No. 663,196**

**The portion of the term of this patent subsequent to Dec. 19, 1989, has been disclaimed.**

**Int. Cl.[3] D06M *13/12***

**U.S. Cl. 8—116.4** **14 Claims**

*13. A process for treating cellulosic fabric-containing material to impart a durable press thereto comprising conveying said material through a first zone to introduce moisture thereinto, conveying the material then through a subsequent treatment zone to subject it to sulfur dioxide vapors, thereafter conveying said material through a subsequent curing zone to subject the material to a curing temperature of above about 65° C., and wherein prior to conveying said material through said curing zone, and prior to or during said treatment with sulfur dioxide vapors, conveying said material through a zone to impregnate it with formaldehyde.*

# PLANT PATENTS

## GRANTED FEBRUARY 2, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

### 4,819
### EARLY COLORING SPUR-TYPE RED DELICIOUS APPLE TREE

**Lester Green, Wenatchee, Wash., assignor to Wells & Wade Fruit Co., Inc., Wenatchee, Wash.**

**Filed Mar. 12, 1979, Ser. No. 19,873**
**Int. Cl.[3] A01H** *5/03*
**U.S. Cl. Plt.—35** **1 Claim**

1. A new and distinct variety of apple tree substantially identical with its parent "Oregon Spur", U.S. Plant Pat. No. 2,816, except it colors approximately ten days ahead of the parent variety.

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### 4,820
### APPLE TREE

**Richard A. Harvey, Selan, Wash., assignor to Columbia & Okanogan Nursery, Inc., Wenatchee, Wash.**

**Filed Nov. 13, 1979, Ser. No. 93,180**
**Int. Cl.[3] A01H** *5/03*
**U.S. Cl. Plt.—34** **1 Claim**

1. A new and distinct variety of early ripening apple tree with yellowish-green, smooth-skinned fruit of medium size as compared with Golden Delicious and Yellow Transparent, a relatively high total solids and acid content, medium size and uniform roundish-conical shape, as shown and described.

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### 4,821
### POINSETTIA NAMED V-10 PINK

**Paul Ecke, Jr., Encinitas, Calif., assignor to Paul Ecke Ranch, Encinitas, Calif.**

**Filed Sep. 5, 1980, Ser. No. 185,123**
**Int. Cl.[3] A01H** *5/00*
**U.S. Cl. Plt.—86** **1 Claim**

1. A new and distinctive poinsettia cultivar, substantially as herein shown and described, characterized by the attractive pink coloration of its many bracts displayed in overlapping arrangement about a tight center to provide a full effect, and by its identity with the variety Gutbier's V-10 with respect to size, appearance and growth, and blooming habits.

# PLANT PATENTS

GRANTED FEBRUARY 2, 1971

# PATENTS

## GRANTED FEB. 2, 1982

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 181–116 | 4,313,380 |
| 376–252 | 4,313,791 |
| 376–247 | 4,313,792 |
| 376–260 | 4,313,793 |
| 376–352 | 4,313,794 |
| 376–280 | 4,313,795 |
| 376–353 | 4,313,796 |
| 376–441 | 4,313,797 |
| 260–029 | 4,314,044 |
| 376–130 | 4,314,180 |
| 372–018 | 4,314,210 |
| 372–032 | 4,314,211 |

# PATENTS

## GRANTED FEB. 2, 1982

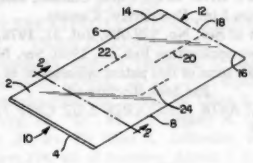
### ERRATA

# PATENTS

## GRANTED FEBRUARY 2, 1982

## GENERAL AND MECHANICAL

**4,313,229**
**DISPOSABLE RAINWEAR**
**Aida L. Villafane, 1920 Sauco St., Santa Maria Rio Piedras, P.R. 00927**
**Filed Feb. 6, 1980, Ser. No. 119,050**
**Int. Cl.[3] A41D *3/04, 3/06***
**U.S. Cl. 2—84** **3 Claims**




1. A disposable and dispensable article of rainwear for the human body, comprising two sheets of waterproof fabric arranged in surface-to-surface relation with their side edges connected to form a sheath,

a. the sheath having an open end edge, and a second end edge which is normally closed,

b. the second end edge of the sheath having at its central part a normally closed tear line,

c. one of the sheets having therein a normally closed tear line extending perpendicularly from the center of the central tear line toward the open end edge to provide with the central tear line a normally closed but openable T-shaped passage for the head of the wearer, and

d. said one of the sheets having therein two normally closed tear lines which are parallel to each other and are positioned respectively adjacent the side edges and are spaced from the second end edge and are so positioned and of sufficient length to permit passage of the arms of the wearer.

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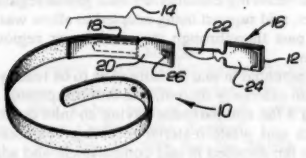
**4,313,230**
**BELT FOR A CONCEALED QUICK-DRAW KNIFE**
**Clarence B. Chovaniec, 6447 Amigo Ave., Reseda, Calif. 91335**
**Filed Jan. 25, 1980, Ser. No. 115,768**
**Int. Cl.[3] A41F *9/00;* 24 *163 K;164***
**U.S. Cl. 2—322** **12 Claims**




1. An article of apparel being configured and arranged to carry a concealed weapon, said article comprising:

holster means included within said article of apparel, said holster means having a first curvature in a longitudinal direction, said holster means for concealing and engaging, at least in part, said weapon; and

a weapon having an elongated blade portion, said blade portion having, at least in part, a second curvature along said longitudinal direction differing from said first curvature, the elongation of said blade portion being generally in said longitudinal direction, said weapon being disposed within said holster means and frictionally retained therein by the difference in said first and second curvatures along said longitudinal direction,

whereby said weapon and holster means are frictionally, securely engaged and whereby said weapon can be withdrawn for use quickly and simply.

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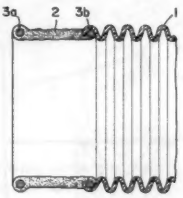
**4,313,231**
**VASCULAR PROSTHESIS**
**Kei Koyamada, Morioka, Japan, assignor to Kabushiki Kaisha Tatebe Seishudo, Tokyo, Japan**
**Filed Oct. 30, 1980, Ser. No. 202,092**
**Claims priority, application Japan, Jun. 16, 1980, 55-83838[U]**
**Int. Cl.[3] A61F *1/24, 1/00***
**U.S. Cl. 3—1.4** **5 Claims**




1. A vascular prosthesis comprising: a tubular main body of flexible and compressible character; two cushioning tubes of flexible, compressible, and suturable character secured coaxially to respective opposite ends of the main body; and two reinforcing rings of elastic and relatively stiff character secured coaxially to respective opposite ends of each cushioning tube in substantially imbedded state therein, the cushioning tubes at intermediate parts thereof between the reinforcing rings thereof being radially compressible upon being clamped by ligating means, which is thereby prevented from shifting in the axial direction of the prosthesis.

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**4,313,232**
**AN ELASTOMERIC MESH HINGE PRIMARILY FOR REPLACEMENT OF THE FINGER JOINTS**
**Mutaz B. Habal, 12901 N. 30th St., Box 16, Tampa, Fla. 33612, and Donald L. Leake, 2 Crest Rd., West, Rollings Hills, Calif. 90274**
**Continuation of Ser. No. 2,545, Jan. 10, 1979, abandoned. This application Oct. 10, 1980, Ser. No. 196,155**
**Int. Cl.[3] A61F *1/03***
**U.S. Cl. 3—1.91** **2 Claims**

1. A method for preparing a joint prosthesis of the type primarily intended for use in repairing joints between adjacent long bones of a human, said method comprising the steps of:

a. trimming opposite end portions of a biocompatible cloth mesh so as to provide an elongate prosthetic blank wherein said opposite end portions extend from a relatively wider central segment;

b. impregnating said blank with a reinforcing material;
c. rolling said end portions axially about the longitudinal dimension of said blank; and
d. applying sufficient additional quantities of said reinforcing material to said rolled end portions so as to eliminate substantially flexing of said opposite end portions with respect to the longitudinal dimension of said blank, whereby said opposite end portions are suitable for attachment in interconnecting relation between adjacent bone structure and said central segment will flex along a single plane.

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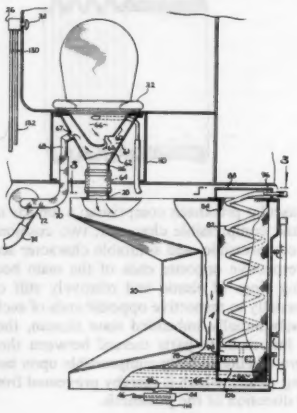
## 4,313,233
## WATERLESS FLUSH TOILET SYSTEM

George C. Roberts, Los Angeles, Calif., assignor to Inca-One Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 7,146, Jan. 29, 1979, Pat. No. 4,222,130. This application Jun. 20, 1980, Ser. No. 161,575
Int. Cl.[3] E03D *1/00, 9/10*
U.S. Cl. 4—321 16 Claims



1. In a waterless flushing toilet system including a toilet, a waste holding tank having a waste inlet and a waste outlet, a supply of nonaqueous flushing fluid stored in said holding tank, said fluid being lighter than and substantially insoluble in water, so that a stratified layer of said fluid is formed on the upper surface of the waste material held in the tank, an improvement comprising:
a flushing fluid pickup device disposed in said tank for removing a quantity of flushing fluid from said tank to be delivered to said toilet for flushing purposes, said flushing fluid pickup device comprising:
a pickup float which floats within said liquid waste compartment, said pickup float having at least one flushing fluid inlet disposed within said layer of flushing fluid, said pickup float having an upper pickup float member, and a lower pickup float member coupled to and spaced-apart from said upper member, said upper and lower members defining a plenum containing flushing fluid with said at least one flushing fluid inlet being disposed in said plenum whereby said flushing fluid which is supplied to said toilet is drawn from said flushing fluid within said plenum; and
a hose having a first end coupled to said pickup float and in communication with said flushing fluid inlet and a second end coupled to a means for supplying said flushing fluid to said toilet wherein said pickup float is suspended by said hose and said hose is substantially in the form of a coil;
a perforated screen member disposed in said tank which divides said tank into a solid waste compartment and a liquid waste compartment, with said waste inlet and outlet being disposed in said solid waste compartment, and with said fluid pickup device disposed in said liquid waste compartment,
whereby solid and liquid waste arriving from said toilet through said waste inlet are deposited in said solid waste compartment, with said screen member impeding transfer of the solid phase waste from the solid waste compartment to said liquid waste compartment where said flushing fluid is picked up by said pickup device.

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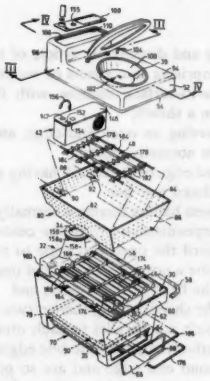
## 4,313,234
## TOILET

John M. Stewart, River Drive Park, Canada, assignor to Santerra Industries Ltd., Downsview, Canada

Continuation of Ser. No. 929,098, Jul. 31, 1978, Pat. No. 4,196,477. This application Feb. 25, 1980, Ser. No. 124,365
The portion of the term of this patent subsequent to Apr. 8, 1997, has been disclaimed.
Int. Cl.[3] A47K *11/02;* C02F *1/02;* C05F *11/08*
U.S. Cl. 4—449 10 Claims



1. A toilet comprising:
a housing defining a waste material receiving chamber and adapted to allow air to flow through the chamber from an inlet to an exhaust vent, the housing including a top which provides a seating surface and which has an opening for permitting entry of waste material to said chamber;
means normally closing said opening when the toilet is not being used;
a perforate waste material support disposed in said waste material receiving chamber above a lower region of said chamber, said support being adapted to allow waste material to pass therethrough into said lower region of the chamber;
a fan unit mounted in said housing so as to be readily removable from externally thereof, said unit comprising: a casing defining a fan compartment having an inlet communicating with said waste material receiving chamber and an outlet; a fan disposed in said compartment and adapted to cause air to flow from said inlet to said outlet; and means in said compartment for heating air passing from said inlet to said outlet; and,
air conduit means having an inlet engaging and communicating with said fan unit outlet for receiving heated air therefrom, and a plurality of heated air outlets, said air conduit means being arranged to deliver heated air issuing from said heated air outlets in use into the lower region of the waste material receiving chamber for contact with waste material on said support;
and said air conduit means and fan unit being adapted to co-operate with one another to provide said communication between said inlet of the air conduit means and said fan unit outlet when the fan unit is mounted in said hous-

ing, and to permit said fan unit outlet to be readily separated from said inlet of the air conduit means when the fan unit is removed from the housing and wherein said conduit means comprises an air manifold assembly including a header and a neck portion which extends upwardly from said header and which is formed with said air inlet of the air manifold assembly, said inlet being disposed in communicating relationship with said outlet of the fan unit, whereby heated air is delivered directly from the outlet of said fan compartment into the air manifold assembly.

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**4,313,235**

## METHOD OF TREATING COTTON CLOTH OF TWISTED YARN IN LOOM STATE

**Ljubov A. Gotovtseva, ulitsa 9 Yanvarya, 30, kv. 28; Maia B. Konkova, prospekt Lenina, 73, kv. 29; Tatyana F. Garbuz, ulitsa 9 Zemledelcheskaya, 3, kv. 55; Oleg A. Bunin, ulitsa Tashkentskaya, 85, "D", kv. 11; Evgeny A. Osminin, ulitsa Gromoboya, 29, kv. 57; Nina A. Zabavina, ulitsa Volodarskogo, 43, kv. 274, all of Ivanovo; Alexei I. Ivanov, ulitsa 1 Maya, 12; Vladimir P. Snopov, ulitsa 1 Polevaya, 30, kv. 19, both of poselok Kamenka Vishugskogo raiona Ivanovskoi oblasti, and Alexandr I. Batkov, ulitsa Baturina, 10, kv. 43, Ivanovo, all of U.S.S.R.**

**Filed May 27, 1980, Ser. No. 153,671**

**Int. Cl.³ D06B** *3/10, 21/00*

**U.S. Cl. 8—149.1** **3 Claims**

1. A method of treating a continuously moving cotton cloth of twisted yarn in loom state comprising the steps of; boiling the continuously moving cloth with simultaneous mercerization in a boiling solution of caustic soda, said boiling of the cloth with simultaneous mercerization being conducted with the cloth being guided alternatingly through the solution of caustic soda and vapors thereof, with the treatment time ratio of 1:1; then steaming the cloth on a roll, under a tension of 5 to 10 kgf/m; then leaching the cloth; then simultaneously bleaching and dyeing the cloth; then steaming the cloth, with said steaming being conducted from 1 to 2 minutes under tension and for 2 to 10 minutes without tension; then washing and drying the cloth; and subjecting the cloth to stentering in the course of said boiling with simultaneous mercerization in the caustic soda vapor phase, prior to said steaming on the roll, prior to said leaching, and in the course of said leaching.

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**4,313,236**

## SAFETY EQUIPMENT FOR BOATS

**Alan W. Tupper, Weavers House, Castle Combe, Wiltshire, and Peter R. Flux, Calne, both of England, assignors to Alan William Tupper, Castle Combe, England**

**Filed Sep. 13, 1979, Ser. No. 75,091**

**Int. Cl.³ B63C** *9/00*

**U.S. Cl. 9—14** **3 Claims**

1. Safety equipment for a boat, which equipment comprises:

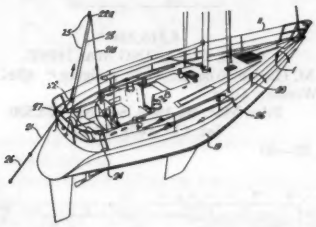
(a) a life-line for location along a peripheral portion of a boat,

(b) support means for rigidly securing the life-line to a boat at a plurality of points along the length of the life-line to hold the line so as to conform to any configuration required by marine design, to which life-line a person can be attached by means of a safety harness,

(c) a traversing device at each end and each intermediate attachment point of the life-line for attaching the life-line to the support means while allowing a lanyard attachment means engaged with the life-line to traverse freely each intermediate attachment point in either direction whether the wearer is inboard or overboard, each traversing device comprising:

(i) a rotatable wheel which is formed with several recesses in its periphery, the recesses being evenly spaced around the wheel and adjacent recesses being separated by a projecting part of the wheel,

(ii) a co-operating guide member supported at a peripheral part of the wheel, and adapted to allow rotation of the wheel about its axis with respect to the guide member while locating the life-line with respect to the wheel whereby a lanyard attachment can be received, guided and passed through the traversing device in recesses of said wheel which rotates relative to said guide member,



(d) at least one towing pendant secured at a first end thereof with respect to the boat for towing a person overboard astern of the boat in a head-up position;

(e) latching means at a second end of the pendant in detachable engagement with a traversing device at an end of the life-line and positioned to receive and firmly engage a lanyard attachment engaged with the life-line when such lanyard attachment reaches that traversing device when a person goes overboard, whereupon the second end of the pendant detaches from that traversing device to tow the person astern of the boat as aforesaid.

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**4,313,237**

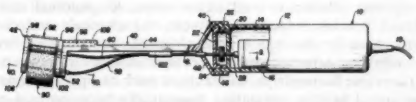
## DRIVEN ROTARY TOOTHBRUSH

**Eric L. Smith, 638 Potomac Ave., Hagerstown, Md. 21740**

**Filed Mar. 18, 1980, Ser. No. 131,371**

**Int. Cl.³ A46B** *13/02*

**U.S. Cl. 15—23** **16 Claims**



1. An electrically operated rotary toothbrush comprising

a hollow handle,

a drive motor sealed in said handle,

an elongated brush support stem having one end adapted to be releasably mounted on said handle,

a plurality of elongated drive shafts extending longitudinally of said elongated brush support stem,

drive means operably connecting said shafts to said motor for rotation thereby when said brush support stem is mounted on said handle, said drive means including

three shaft members mounted for rotation about spaced axes, and means interconnecting said three shaft members for simultaneous rotation about their respective axes by said motor,

telescoping stem coupling means for rotatably connecting said elongated shafts one to each of said shaft members while permitting free axial movement therebetween whereby said support stem may be readily mounted upon and removed from said handle,

friction means for releasably retaining the support stem on said handle,

guide means adapted to align said elongated shafts with said shaft members when the support stem is mounted on the handle,

a brush head including a plurality of rotary brushes mounted for rotation about spaced generally parallel axes,

mounting means for releasably supporting said brush head on the other end of said support stem, said mounting means including cooperating means on said stem and said brush head for frictionally retaining the brush head on the stem, and

brush coupling means rotatably coupling said rotary brushes one to each of said plurality of elongated drive shafts when the brush head is mounted on said support stem.

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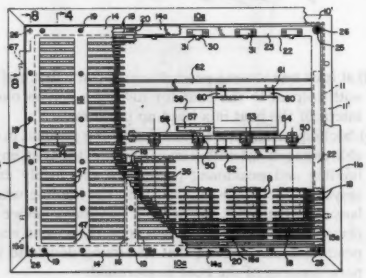
**4,313,238**

## SHOE CLEANING MACHINE

**Charles M. Harbin, Wooster, Ohio, assignor to AMCS Corporation, Wooster, Ohio**

**Filed Mar. 10, 1980, Ser. No. 128,530**
**Int. Cl.³ A47L *23/22***
**U.S. Cl. 15—37** **11 Claims**



1. A shoe cleaning machine adapted to be embedded in the floor, comprising a housing, a rectangular grid frame within the top of the housing having horizontal side strips and flat longitudinally spaced co-planar intermediate transverse strips, longitudinal rods supporting said frame strips, downwardly open transversely spaced longitudinal channels supported on said rods between said transverse strips with their webs in coplanar relation to said frame strips, longitudinal rows of brush bristles projecting between the channels and closely embraced by the legs of said channels, said rows of bristles comprising separate parallel sections extending between said transverse frame strips, said sections each comprising convexly arranged bristles projecting tangentially between said channels, and means for oscillating said bristles.

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**4,313,239**

## HINGE MOUNTING PLATE

**Ken Tsuneki, Tokyo, Japan, assignor to Sugatsune Industrial Co. Ltd., Tokyo, Japan**

**Filed Oct. 25, 1979, Ser. No. 88,031**
**Int. Cl.³ E05D *7/04***
**U.S. Cl. 16—236** **1 Claim**

1. A hinge mounting plate for securing a door to a supporting wall (21), said hinge mounting plate comprising in combination:

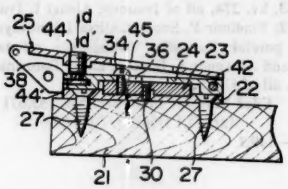
(a) an elongated flat rectangular base plate (22) which base plate is to be secured to a wall (21), said base plate having recess grooves (28);

(b) a hinge supporting arm (25) having an inverted U-shaped cross-section, which supporting arm (25) is to be pivotally secured to a door, said supporting arm (25) having side walls (40) and a rear pivoting end;

(c) a first control plate (23) of a width narrower than said base plate (22) with a lower surface disposed over the base plate with engaging means to engage said recess grooves (28) and with an upper surface;

(d) an elevational guide aperture (33) in said first control plate (23) with a mounting screw (30) fastened to the base plate (22) for holding the first control plate (23) thereto;

(e) a longitudinal and lateral second control plate (24), with front and rear ends having a lower recess (35) therein so sized that the second control plate (24) is disposed over the upper surface of the first control plate (23) so that the first control plate (23) is in said recess, a first aperture (36) passing through said recess with a first control screw (34) for fastening said second control plate (24) to said first control plate (23), and a second aperture (37) of larger diameter than said first aperture to insert the head of said first control screw (34) therethrough, a third aperture (38) at the front end of said second control plate (24) said third aperture (38) having an enlarged inner portion (38');



(f) a lateral control screw (44) passing through said third aperture (38), said lateral control screw (44) having a neck portion (44') engaged with said enlarged inner portion (38'); and,

(g) pin pivot means (42) holding said supporting arm (25) to said second control plate (24) at the rear end of said supporting arm (25) and the rear end of said second control plate (24); whereby,

the base plate (22) is first secured to a wall (21) by screws, the first control plate is placed over the base plate (22) and engaged with the recess grooves in said base plate, adjusted longitudinally and fastened by the mounting screw (30), the second control plate (24) is then placed over the first control plate (23) so that the first control plate (23) is in the lower recess (35), first control screw (34) in first aperture (36) is fixed after adjusting said second control plate (24), and, lateral control screw (44) in third aperture (38) is used to adjust said supporting arm (25).

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**4,313,240**

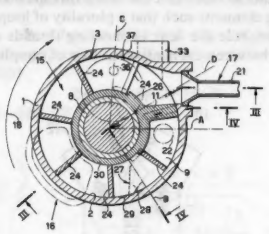
## ROTARY FEED PUMP FOR A CONTINUOUS MACHINE FOR FILLING SKINS WITH MINCEMEAT

**Giovanni B. Righele, Zane', and Giuseppe Scorzato, Marano, both of Italy, assignors to Risco Brevetti S.p.A., Zane', Italy**

**Filed Apr. 30, 1980, Ser. No. 145,261**
**Claims priority, application Italy, Apr. 30, 1979, 21460 B/79**
**Int. Cl.³ A22C *11/08***
**U.S. Cl. 17—37** **4 Claims**

1. A rotary pump for a continuous machine for filling skins with mincemeat, comprising a stator provided with a cylindrical cavity in which a rotor rotatable about its own axis is coaxially disposed, said rotor being composed of a raised cylindrical central part and a lowered annular peripheral part such that between said stator and said rotor there is defined an upper annular chamber provided with a filling mouth, a delivery mouth with its axis substantially tangential to said annular chamber in the direction of rotation of the rotor, and a dividing baffle disposed immediately downstream of said delivery mouth in the direction of rotation of the rotor, blades being slidably housed in said peripheral part of the rotor and being caused to slide along the axis of the rotor in accordance with a

predetermined programme which provides for them to emerge from the overall limits of said peripheral part of the rotor in a zone downstream of said dividing baffle and upstream of said filling mouth, and to completely return within the overall limits of said peripheral part of the rotor in a zone downstream of said filling mouth and upstream of said delivery mouth, said predetermined programme being defined by a lower annular cam disposed rigid with the stator below said peripheral part of



the rotor, and with the upper shaped surface of which are engaged the lower ends of said blades, and an upper annular cam complementary to the lower one, and with which are engaged the upper ends of said blades, wherein said dividing baffle and said upper annular cam are rigid with a closure plate for the annular pumping chamber constituted by a single-piece cover mounted on said raised central part by means of a rigid annular collar disposed between said central part of the rotor and said rotor blades.

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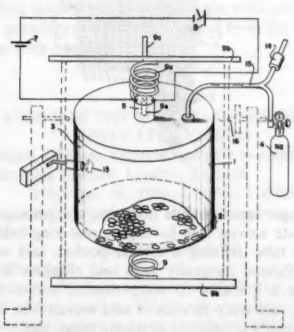
**4,313,241**

## METHOD FOR OPENING SHELLFISH

**John E. Comparetto, 3306 Glen Carlyn Rd., Falls Church, Va. 22041**

**Filed Oct. 27, 1978, Ser. No. 955,549**
**Int. Cl.³ A22C *29/04***
**U.S. Cl. 17—48** **8 Claims**



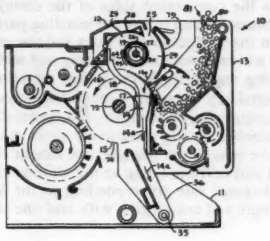
**1.** The process of opening shellfish comprising placing shellfish in a chamber, closing the chamber, holding the chamber closed with a magnet, passing energy waves through the fluid surrounding the shellfish in the chamber inducing hyperbaric pressures over shellfish, slightly compressing the shellfish, then suddenly releasing the magnet and decreasing pressure to ambient values or to negative values.

**4,313,242**

## AUXILLIARY SEED DISCHARGE FOR COTTON GIN ROLL BOX

**Joe E. Salmon, 2453 Shades Crest Rd., Birmingham, Ala. 35216**

**Filed May 30, 1979, Ser. No. 44,343**
**Int. Cl.³ D01B *1/08***
**U.S. Cl. 19—55 R** **26 Claims**



**1.** Auxilliary seed discharge means for a saw type cotton gin comprising in combination:

A. a main frame having a rotating saw cylinder journaled therein,

B. a ginning breast and a huller breast movably mounted on said frame from closed to open positions,

C. a roll box in said ginning breast to receive seed cotton introduced through said huller breast,

D. spaced gin saws on said saw cylinder projecting through the roll box and arranged to pull seed cotton from the huller breast into the roll box to form a rotating seed roll and to separate lint from seed therein.

E. a gravity seed discharge from said roll box,

F. circular openings in the end heads of the roll box in the approximate axial center thereof,

G. a seed chute rigidly supported from one of said end heads and having circular openings in axial alignment with the openings in said roll box heads,

H. a cylinderical casing connected in axial alignment between the said openings in the chute and the adjacent roll box,

I. a plate mounted over the circular opening in the opposite end head, said plate hving a central circular opening in axial alignment with said openings in said heads,

J. a rotatable shaft extending axially through the roll box and outwardly through said casing and said opposite end head into bearings affixed on the outside of said chute and plate,

K. a section of constantly tapered helicoid flight the length of said roll box mounted on said shaft and projecting into the core of said seed roll to convey even amounts of seed laterally from the full length thereof when rotated in the same direction and at speeds greater than that of said seed roll.

L. a straight section of conveyor flight joining the large end of said tapered flight and extending through said casing into said seed chute,

M. a pulley on said shaft independently driven from a power source forward of said shaft, said power source being adapted to drive the shaft at selective speeds.

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**4,313,243**

## SLIDING WEDGE CABLE CLAMP

**Ray R. Childress, and Stephen R. Childress, both of P.O. Box 853, Richlands, Va. 24641**

**Filed Apr. 12, 1979, Ser. No. 29,372**
**Int. Cl.³ F16G *11/04***
**U.S. Cl. 24—136 K** **1 Claim**

**1.** A sliding wedge cable clamp comprising,

a casing having opposed flat front and rear sides and opposed convergent ends connecting said sides,

said casing having an open mouth between the convergent

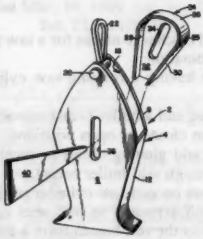
ends providing an entry through which the bight and adjacent standing parts of a cable may be inserted,

a wedge thimble slidable in said casing, said wedge thimble having a rounded end adapted to be engaged in the cable bight and convergent sides respectively opposite the convergent sides of the casing whereby application of tension to one of the standing parts of the cable tends to move the wedge thimble so that the convergent sides thereof move towards the convergent sides of the casing whereby to apply forces tending to jam the standing parts of the cable between the wedge thimble sides and the casing sides,

said front and rear walls of said casing and said wedge thimble having registering keyway slots therethrough,

and a tapered key engaging through said keyway slots,

said key comprising an elongate, flat, generally right-triangular member having a relatively short side corresponding to the base of the triangle, one side at right angles to the end and corresponding to the altitude of the triangle, and a diagonal side corresponding to the hypotenuse of the triangle and converging with said one side at an apex



whereby, upon insertion of the key through said keyway slots with the diagonal side of the key disposed away from the mouth of the casing, said wedge thimble is cammed so that the convergent sides thereof move away from the convergent sides of the casing,

both of said keyway slots in the casing walls being shorter in length than the end of the key whereby engagement of the diagonal side of the key against an end of either keyway slot in the casing walls prevents the end of the key from entering the interior of the casing,

one of the keyway slots in the casing wall being shorter than the other keyway slot in the other casing wall whereby when the apex of the key is inserted first through the shorter slot, the length of insertion thereof is limited to a greater extent than when the apex of the key is inserted through the longer slot, so that the maximum spacing between the convergent sides of the wedge and the convergent ends of the casing is less when the apex of the key is inserted first through the shorter slot than when it is inserted first through the longer slot.

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**4,313,244**

## WOVEN SLIDE FASTENER STRINGER WITH MOLDED REINFORCING PROJECTIONS ON UPPER CONNECTING THREADS

**Charles A. Authier, Meadville, Pa., assignor to Talon, Inc., Meadville, Pa.**

**Filed Sep. 10, 1979, Ser. No. 73,964**
**Int. Cl.³ A44B *19/04***
**U.S. Cl. 24—205.13 R** **3 Claims**

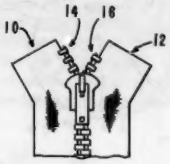
1. A woven stringer for a slide fastener comprising

a plurality of spaced polymer coupling elements each having a head portion and a pair of leg portions extending in generally the same direction from opposite sides of the head portion and terminating in heels,

four connecting threads, respective pairs of which have spaced segments embedded in the respective leg portions to join the coupling elements into a train wherein lower connecting threads are disposed adjacent to the heels of the leg portions and upper connecting threads of the respective pairs of connecting threads are disposed intermediate the heels and the head portions,

each coupling element having a pair of integrally molded projections of polymer extending in opposite directions from the respective leg portions of each coupling element along the upper connecting threads,

a woven tape having a plurality of warp threads and a weft thread interwoven with the warp threads and the train of coupling elements such that a plurality of loops of the weft thread encircle the four connecting threads and the projections between each adjacent pair of coupling elements,




said projections extending only partially across spaces between adjacent coupling elements and being spaced from the lower connecting threads so as to permit free compression of the lower connecting threads between adjacent coupling elements, and

said upper and lower connecting threads having respective lengths thereof substantially free of molded polymer between adjacent coupling elements wherein the lengths of lower connecting threads substantially free of molded polymer are substantially greater in length than the lengths of upper connecting threads free of molded polymer.

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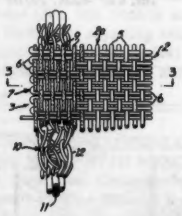
**4,313,245**

## STRINGER TAPE FOR SLIDE FASTENERS

**Yoshiharu Yamaguchi, Namerikawa, Japan, assignor to Yoshida Kogyo, K.K., Japan**

**Filed May 24, 1979, Ser. No. 42,108**
**Claims priority, application Japan, Jun. 10, 1978, 53-79777[U]**
**Int. Cl.³ A44B *19/00***
**U.S. Cl. 24—205.16 R** **4 Claims**



1. A stringer tape for slide fasteners, comprising:

an elongate woven web having on one longitudinal edge a woven tube defining a tubular pocket, said woven tube being formed integrally with said elongate web and including a plurality of warp threads and a single weft thread, said warp threads of said woven tube being made of thermally shrinkable synthetic resin; and

a reinforcing filler extending through said tubular pocket and including an elongate central core and a warp-knit surrounding said elongate central core and extending longitudinally therewith, said warp-knit tube having on its periphery a plurality of longitudinal wales, said warp threads of said woven tube being heat-set and thereby thermally shrunk to clench said warp-knit tube therein so

as to be received in interwale grooves between said wales, whereby said woven tube and said reinforcing filler are firmly joined together.

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**4,313,246**

## BELT BUCKLE OR LOCK FOR A SAFETY BELT

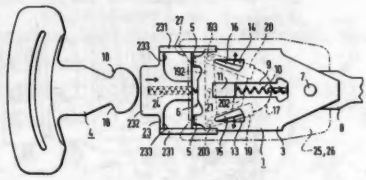
**Artur Föhl, Schorndorf-Haubersbronn, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany**

**Filed Jul. 16, 1980, Ser. No. 169,632**

**Claims priority, application Fed. Rep. of Germany, Jul. 23, 1979, 2929803**

**Int. Cl.³ A44B *11/26***

**U.S. Cl. 24—230 AT** **7 Claims**



1. Belt-lock and plug-in tongue for a safety belt comprising a lock-housing having a plug-in opening, a plug-in tongue having two locking edges with one locking edge disposed on each side of the tongue, for insertion of the plug-in tongue with its two locking edges into the plug-in opening, a locking mechanism with two metal locking latches, each having a wedge-shaped cross section, tensioned against each other by a common spring and with one locking latch disposed on each side of the plug-in opening to engage said locking edges on each side of the tongue upon insertion of the tongue into the plug-in opening, said lock-housing formed by two metal plates which are parallel to each other, and form the plug-in openings, said plates having wedge-or triangular shaped cut-outs arranged symmetrically to the path of the plug-in tongue and in which cut-outs said locking latches are retained without use of bearing pins but are movable therein to engage the locking edges of the tongue, a hand-actuated member movable against the force of a spring mounted on the lock-housing, said locking mechanism having disengaging means to move the two locking latches out of engagement with said two locking edges, said hand-actuated member upon pressure exerted thereon movable against said disengaging means to simultaneously move said two locking latches out of engagement with said two locking edges to permit removal of the tongue from the plug-in opening of the lock-housing.

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**4,313,247**

## APPARATUS FOR THE MANUFACTURE OF MINERAL INSULATED CABLES

**Ivan Stuttard, Oldham, England, assignor to Associated Electrical Industries Limited, London, England**

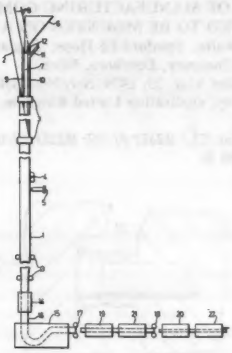
**Filed Jan. 30, 1980, Ser. No. 116,935**

**Claims priority, application United Kingdom, Feb. 8, 1979, 04409/79**

**Int. Cl.³ A05B *3/28***

**U.S. Cl. 29—33 F** **10 Claims**

1. Apparatus for the manufacture of mineral insulated electric cable which includes means for continuously bending a downwardly travelling strip of ductile metal into the form of a tube and means for seam welding the meeting edges of the bent strip, while the said edges are travelling along a vertically downward path, to form a tubular sheath, a powder delivery tube disposed vertically so as to be located within, and spaced from, the bent strip and formed sheath, and having its outlet end located at a level below that of the welding means, means for feeding powdered insulating material into the said powder delivery tube at a controlled rate, means for feeding at least one continuous length of conductor wire into the formed sheath, means for guiding each said wire into a desired position within the sheath, means for reducing the diameter of the formed sheath, in a plurality of stages, subsequently to the introduction of the insulant powder and each wire into the sheath, and means for annealing and quenching the sheath after each reduction stage, at least the first reduction and annealing



means being located vertically below the sheath forming and welding means, wherein the said conductor wire feeding means is arranged to feed each length of wire vertically downwards in a predetermined location along the outside of the powder delivery tube, and the said means for guiding each said wire into a desired position within the sheath is located along the exterior of the powder delivery tube.

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**4,313,248**

## METHOD OF PRODUCING HEAT TRANSFER TUBE FOR USE IN BOILING TYPE HEAT EXCHANGERS

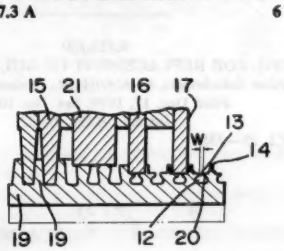
**Jun Fujikake, Yamato-Kooriyama, Japan, assignor to Fukurawa Metals Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 881,860, Feb. 27, 1978, Pat. No. 4,216,826. This application May 1, 1979, Ser. No. 34,920**

**Claims priority, application Japan, Feb. 25, 1977, 52/20084; Feb. 25, 1977, 52/20085; Nov. 25, 1977, 52/143719**

**Int. Cl.³ B23P *15/26***

**U.S. Cl. 29—157.3 A** **6 Claims**



1. A process for producing a heat transfer tube for use in boiling type heat exchangers, comprising the steps of:

(a) contacting a fin-forming disk tool with the surface of a metal tube in order to form fins having side walls extending upward from said tube to a top fin surface;

(b) contacting a roller disk tool with said top surfaces of said fins compressing and forcing said top surfaces downward to such an extent that said fins are compressed resulting in widening of said fins near said top surfaces forming shoulders on said fins and cavities between adjacent fins, said roller disk tool having a circumferential surface which contacts said top surfaces of said fins, said surface of said

roller disk tool being positioned directly over said cavities and having a breadth such that a portion of said surface will contact, in equal amounts, a portion of the top surfaces of only two adjacent fins, and said cavities communicating with the outside through narrow gaps formed between adjacent shoulders of said adjacent fins.

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**4,313,249**

## METHOD OF MANUFACTURING COMPONENTS ADAPTED TO BE MOUNTED ON A SHAFT

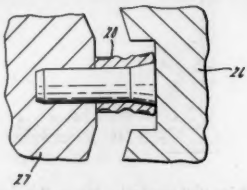
**Donald Douthwaite, Stanford-Le-Hope, England, assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Mar. 23, 1979, Ser. No. 23,427**

**Claims priority, application United Kingdom, Mar. 23, 1978, 11608/78**

**Int. Cl.³ B21D *41/02*; B22D *19/04***

**U.S. Cl. 29—159 B** **7 Claims**




1. A method of manufacturing a steering wheel hub component adapted to be mounted on a shaft which comprises the steps of:

forcing a tubular insert having a substantially uniform internal diameter into engagement with a mandrel having an external surface at least part of which diverges to a diameter greater than the internal diameter of the insert;

deforming the insert so that its internal surface is cylindrical at one end and diverges outwardly towards the other end; and

moulding a rigid steering wheel hub body around the insert while the insert is engaged with the mandrel such that the body is rigidly connected to the insert and the insert with the divergent surface at one end and the cylindrical surface at another end is properly positioned within the hub body; and

disengaging the mandrel and the insert.

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**4,313,250**

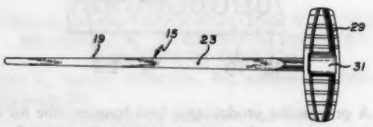
## TOOL FOR REPLACEMENT OF GOLF CLUB GRIP

**Bronislaw Sokolowski, 44 Aldrich St., Webster, Mass. 01570**

**Filed Dec. 17, 1979, Ser. No. 104,266**

**Int. Cl.³ B23P *19/02***

**U.S. Cl. 29—235** **1 Claim**




1. Awl for use in removing an old grip from a golf club shaft, comprising:

(a) a handle provided with an elongated notch, and

(b) an elongated blade which is parallel with the notch and is tapered to a point at the end farthest from the handle, the blade being provided with a flat surface on the side that faces in the same direction as the notch and a convex arcuate surface on the opposite side, the flat surface extending through substantially the entire length of the blade, the notch being open at its ends and having a bottom surface that lies approximately on an extension of the flat surface of the blade.

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**4,313,251**

## SYSTEM FOR APPLYING ELECTRONIC COMPONENTS TO A CIRCUIT BOARD

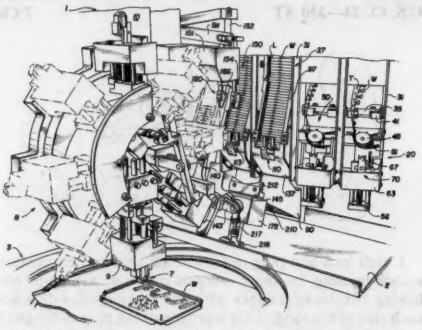
**Koichi Asai, Nagoya, and Tohsuke Kawada, Chiryu, both of Japan, assignors to Fuji Mfg. Co., Ltd., Aichi, Japan**

**Filed Sep. 6, 1978, Ser. No. 940,141**

**Claims priority, application Japan, Mar. 24, 1978, 53-34659**

**Int. Cl.³ B23P *23/00***

**U.S. Cl. 29—564.6** **11 Claims**



1. An electronic-component mounting system composed of an electronic-component-mounting machine for mounting electronic components to a printed circuit board and an electronic-component supplying machine for supplying electronic components to said electronic-component mounting machine, said electronic-component supplying machine comprising:

at least one cartridge for containing radial type electronic components, having respectively therein a container containing a tape, to which each of a pair of lead wires extending in a same parallel direction from a head of said radial type electronic components is stuck at the tip portions thereof; a tape-drawing-out mechanism for pulling out a tape loaded with said components from a basket body; and a lead wire positioning mechanism for positioning one after another said pair of lead wires stuck on said tape in relation to said electronic component mounting machine;

a cutting mechanism associated with such a cartridge containing radial type electronic components for shearing the positioned lead wires of said radial type electronic components;

at least one cartridge for containing axial type electronic components having respectively therein a container containing a pair of tapes, to which each pair of lead wires extending in a same axial but opposite direction from a head of said axial type electronic components are respectively stuck at each tip portion thereof, to be pulled out with one end ahead, and a form-rectifying and positioning mechanism associated with such a cartridge containing axial type electronic components for shearing one after another said pair of lead wires stuck on said tapes, rectifying form of said lead wires by bending the same at right angle into a mutually parallelly extending status with a predetermined distance from each other, and positioning the form-rectified lead wires in relation to said electronic component-mounting machine; and

a table to which said two types of cartridges are attached, in a desired order and in an easily detachable manner, said table and said mounting machine being relatively movable to each other for making desired one of said cartridge confront said mounting machine; and wherein

said electronic-component mounting machine is provided

with at least one chuck for commonly receiving both of the radial type electronic components and the axial type electronic components directly from the two types of cartridges irrespective of mixture of types, holding said components at their lead wires, and transferring the held components to right above lead-wire-inserting holes of said printed circuit board into which said held lead wires are to be inserted.

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**4,313,252**

## ARRANGEMENT FOR AUTOMATICALLY CHANGING CLAMPING JAWS OF THE CHUCK OF A MACHINE TOOL

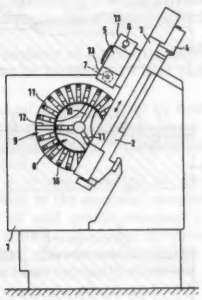
**Joachim Kuska, Langenhagen, and Günter Twiefel, Burgwedel, both of Fed. Rep. of Germany, assignors to Gildemeister AG, Bielefeld, Fed. Rep. of Germany**

**Filed Nov. 5, 1979, Ser. No. 91,054**

**Claims priority, application Fed. Rep. of Germany, Nov. 13, 1978, 2849188**

**Int. Cl.³ B23Q *3/155***

**U.S. Cl. 29—568** **12 Claims**



1. An arrangement for automatically changing clamping jaws of the chuck of a machine tool having a turning carriage and a cross-slide rest, comprising:

a clamping jaw magazine having aligning guides for the clamping jaws stored therein and alignable with the clamping jaw guides of the chuck, and

a transfer device having a transfer element displaceable in the direction of the aligning guides,

said transfer element being on the cross-slide rest.

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**4,313,253**

## METHOD OF FABRICATING A CHARGE TRANSFER CHANNEL COVERED BY A STEPPED INSULATING LAYER

**Donald L. Henderson, Sr., Encinitas, Calif., assignor to Burroughs Corporation, Detroit, Mich.**

**Division of Ser. No. 61,755, Jul. 30, 1979, abandoned. This application Jan. 18, 1980, Ser. No. 113,388**

**Int. Cl.³ H01L *21/223, 21/26***

**U.S. Cl. 29—571** **7 Claims**

1. A method of fabricating a memory cell on a semiconductor substrate comprised of dopant impurity atoms of a first type and having a first surface, including the steps of:

defining a charge storage region and an adjacent charge transfer channel in said substrate near said first surface;

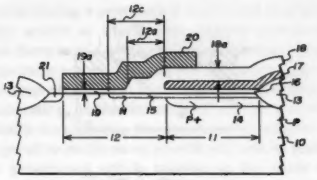
introducing a deep layer of dopant impurity atoms of said first type throughout said charge storage region;

introducing a shallow layer of dopant impurity atoms of a second type opposite to said first type throughout said charge storage region and also extending therefrom into a first adjacent portion of said charge transfer channel;

forming a relatively thin insulating layer over said charge storage region;

forming a first patterned conductor on said relatively thin insulating layer over said charge storage region;

forming a relatively thick insulating layer over said first patterned conductor, and also extending therefrom over a second adjacent portion of said charge transfer channel that lies within said first adjacent portion so that said shallow layer of dopant impurity atoms lies under and



extends beyond said relatively thick insulating layer in said charge transfer channel;

forming a relatively thin insulating layer over that portion of said charge transfer channel which is not covered by said relatively thick insulating layer; and

forming a second patterned conductor on said relatively thin insulating layer over said charge transfer channel and extending onto said relatively thick insulating layer.

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**4,313,254**

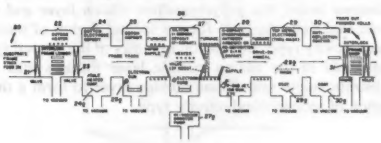
## THIN-FILM SILICON SOLAR CELL WITH METAL BORIDE BOTTOM ELECTRODE

**Charles Feldman, Washington, D.C.; Harry K. Charles, Baltimore, and Frank G. Satkiewicz, Ellicott City, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.**

**Division of Ser. No. 89,496, Oct. 30, 1979. This application Aug. 4, 1980, Ser. No. 174,739**

**Int. Cl.³ H01L *31/18***

**U.S. Cl. 29—572** **11 Claims**



1. A method for producing a thin film p-n junction device comprising the steps of:

vacuum depositing a first layer of transition metal on an electrically nonconducting substrate material,

vacuum depositing a second layer of boron (B) overlying said first layer,

heating the materials at a temperature and for a time sufficient to cause the transition metal and the (B) to form a transition metal boride layer,

vacuum depositing p-type silicon (Si) on said transition metal boride layer at a substrate temperature between 900°–1300° centigrade and at a rate between 500–5000 Angstroms per minute to a thickness of between 10–30 μm,

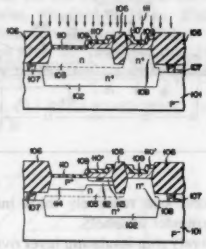
doping the (Si) with an n-type material to form a p-n junction, and

attaching separate electrode means to said n-type material and said metal boride layer respectively.

## 4,313,255
## METHOD FOR MANUFACTURING INTEGRATED CIRCUIT DEVICE

Satoshi Shinozaki, and Shinzi Saito, both of Yokohama, Japan, assignors to VLSI Technology Research Association, Japan

Filed Dec. 21, 1979, Ser. No. 105,937
Claims priority, application Japan, Dec. 23, 1978, 53-160345
Int. Cl.³ H01L 21/425, 21/74
U.S. Cl. 29—576 B 7 Claims



1. A method for manufacturing an integrated device comprising the steps of preparing a semiconductor substrate having an isolated region of a first conductivity type;

forming on a selected portion of said isolated region a polycrystalline silicon layer containing a dopant impurity of said first conductivity type;

forming a silicon dioxide layer over the isolated region, including said doped polycrystalline silicon layer,

subjecting the isolated region, including the silicon dioxide layer and the doped polycrystalline silicon layer, to an ion implantation of an impurity of a second conductivity type having a higher diffusion coefficient than that of the impurity of said first conductivity type, to thereby implant an impurity of said second conductivity type into said layers;

heating said substrate and said layers for a sufficient period to diffuse the impurities of the first and second types to said substrate, whereby the impurity of the first type diffuses into the substrate below the polycrystalline silicon layer to form a first region of first conductivity type, the ion-implanted impurity of the second type diffuses into the substrate below the polycrystalline silicon layer and beyond said first region to form a second region of second conductivity type, and the ion impurity of the second type implanted in the silicon dioxide layer diffuses into the substrate below said silicon dioxide layer to form a third region of second conductivity type.

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## 4,313,256
## METHOD OF PRODUCING INTEGRATED MOS CIRCUITS VIA SILICON GATE TECHNOLOGY

Dietrich Widmann, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 7, 1980, Ser. No. 109,808
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1979, 2902665
Int. Cl.³ H01L 21/31, 21/441
U.S. Cl. 29—579 4 Claims

1. A method of producing integrated n- or p-channel MOS circuits in silicon gate technology with self-adjusting contacts, comprising the steps:

(a) producing structure $SiO_2$ layers (1) on a p- or n-doped semiconductor substrate (2) for separation of active transistor regions according to the so-called LOCOS or isoplanar technique;

(b) oxidizing the free p- or n-substrate surfaces so as to attain gate oxidation;

(c) depositing a $n^+$- or $p^+$-doped polysilicon layer (4) over the entire structure surface;

(d) depositing a silicon nitride layer over the entire structure surface;

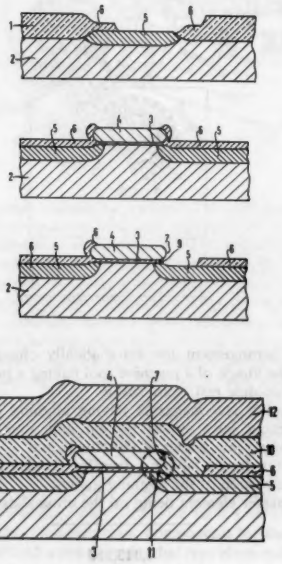
(e) etching the silicon nitride and the polysilicon layers so as to produce nitride-coated polysilicon regions;

(f) producing monocrystalline $n^+$- or $p^+$-doped source and drain regions (5) in the p- or n-doped substrate (2) by ion implantation;

(g) producing a $SiO_2$ layer (6) over the monocrystalline $n^+$- or $p^+$-doped regions (5) by thermal oxidation whereby the oxidation of the polysilicon regions (4) is prevented by the silicon nitride layer positioned over the polysilicon regions (4) and an oxide layer is produced only on the slope surfaces;

(h) removing the nitride masking;

(i) etching contact holes for formation of contacts between monocrystalline $n^+$- or $p^+$-doped regions (5) and polysilicon regions (4) and/or metal interconnections (12), whereby in the region of buried contacts (9), because of an



isotropic etching attack, overhanging polysilicon edges (7) are formed;

(j) depositing a $n^+$- or $p^+$-doped polysilicon layer (8) on the entire structure surface whereby the regions (9) beneath the overhanging polysilicon edges (7) are filled with polysilicon (8);

(k) depositing a layer of silicon nitride on the entire structure surface;

(l) etching the silicon nitride layer except at those locations at which contacts to the metal interconnections (12) are provided;

(m) converting the uncovered polysilicon layer (8) into a $SiO_2$ layer by thermal oxidation, whereby the portions of the polysilicon layer (4) covered with nitride remain unchanged, and, in the region of the buried contacts (9), a polysilicon contact bridge (11) is formed between the monocrystalline $n^+$- or $p^+$-doped regions (5) and the overhanging edges (7) of the polysilicon region (4);

(n) removing the nitride masking; and

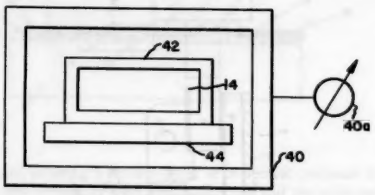
(o) producing a desired metal interconnection pattern (12).

4,313,257

## ANNEALING METHODS FOR IMPROVING PERFORMANCE OF A RADIATION SENSOR

Henry H. Woodbury, Scotia, and Robert S. Lewandowski, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 19, 1979, Ser. No. 95,291
Int. Cl.³ G02F 1/01; C09K 11/24
U.S. Cl. 29—592 R 11 Claims




1. A method for fabricating a sensor providing an electrical output responsive to an incident radiation flux, comprising the steps of:

(a) providing a member of a material emitting optical photons responsive to incidence of said radiation flux upon said material;

(b) thermally annealing the member by heating the member to a selected temperature between about 500° C. to about 575° C.; and then cooling the heated member to room temperature; and

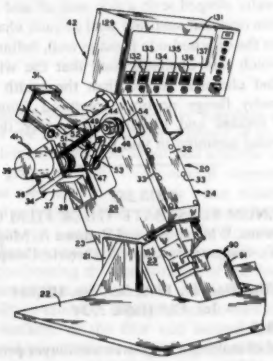
(c) positioning a photon detector to receive the optical photon emissions of the annealed member for forming an output signal of said sensor responsive to the incident radiation flux and having a value of hysteresis less than the hysteresis value of a sensor fabricated with a member which has not been thermally annealed.

4,313,258

## METHODS AND APPARATUS FOR USE IN MAKING ELECTRICAL INTERCONNECTIONS

Alan L. Kindig, and Albert J. Wesseldyk, both of Holland, Mich., assignors to General Electric Company, Fort Wayne, Ind.

Filed Oct. 18, 1979, Ser. No. 85,992
Int. Cl.³ H02K 15/00
U.S. Cl. 29—596 11 Claims



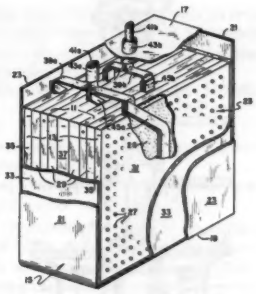
1. A method of performing manufacturing operations on an article involving utilization of preselected manufacturing apparatus while it is at least partly controlled by automatic control means, said apparatus being controllable to perform a plurality of distinct operations under the joint influence of an operator and the automatic control means, said method comprising: selecting a predetermined indicia bearing means for a preselected article; interfacing the predetermined indicia bearing means with the automatic control means and thereby conditioning the automatic control means to become operable for automatically controlling at least one operational aspect of the apparatus during the performance of the plurality of distinct operations; manually conditioning the control means in accordance with information derived from the indicia bearing means; manipulating a preselected article and positioning such preselected article so that a first distinct operation can be performed thereon at a work station of the apparatus; activating the apparatus and performing the first distinct operation on the preselected article with the apparatus performing the first distinct operation under the control of the control means; automatically conditioning the apparatus to perform a second distinct operation on the same preselected article; manipulating the same preselected article relative to the work station in preparation for the performance of the second distinct operation; activating the apparatus and performing the second distinct operation on the preselected article; and continuing to alternately manipulate the article and perform distinct operations thereon with the apparatus until the complete cycle of machine operation as determined by the automatic control means is completed.

4,313,259

## METHOD FOR MANUFACTURING AN ELECTROCHEMICAL CELL

Thomas D. Kaun, New Lenox, and Paul F. Eshman, Bolingbrook, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 9, 1980, Ser. No. 148,325
Int. Cl.³ H01M 10/04, 10/28
U.S. Cl. 29—623.2 3 Claims



1. A method of preparing a secondary electrochemical cell including a housing having a top opening, positive electrodes containing a solid transition metal chalcogenide as electrochemically active material, negative electrodes containing an alloy of an alkali metal or an alkaline earth metal as electrochemically active material, a plurality of porous frangible boron nitride felt layer as electrically insulative separators between said electrodes and an electrolytic salt containing metal halides selected from the group consisting of alkali metal halides, alkaline earth metal halides and mixtures thereof said method comprising:

preparing a plurality of positive and negative electrodes of near equal dimensions at major surfaces, each electrode comprising an outer enclosure of rigid electrically conductive metal having perforated major surfaces and edge surfaces defining a compartment containing void volume and the respective electrochemically active material for

said electrodes and providing each electrode with electrical terminal means communicating with said enclosure;
immersing said electrodes in said electrolytic salt in molten state to substantially fill the void volume thereof;
permitting said electrolytic salt to solidify within the void volume of said electrodes;
treating said plurality of porous frangible felt layers with a ceramic powder selected from magnesia or yttria to fill a portion of their porous void volume;
assembling an array of said positive and negative electrodes in alternate sequence separated by said treated porous frangible felt layers between major surfaces of electrodes of opposite polarity within a u-shaped sheet of electrically insulative material over edge surfaces of said electrodes, said array assembled with electrodes of like polarity having major surfaces exposed at opposite ends thereof;
inserting said assembled array as a unit into the top opening of said cell housing; and
sealing said housing top opening while providing electrically insulative feedthroughs for said electrical terminal means of said positive and of said negative electrodes.

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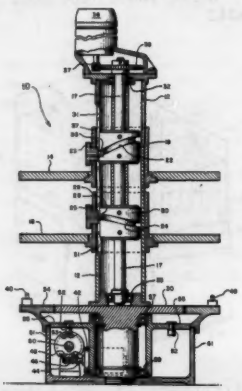
**4,313,260**

## ASSEMBLY MACHINE

**Norman H. Yeo, Georgetown, Mass., and Douglas Swanson, McKean, Pa., assignors to Swanson-Erie Corporation, Erie, Pa.**

**Filed Apr. 2, 1979, Ser. No. 26,023**
**Int. Cl.³ B23P *19/04***
**U.S. Cl. 29—792** **20 Claims**



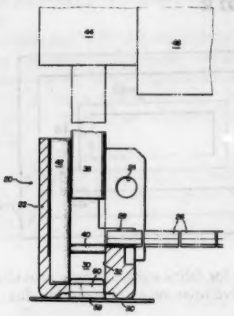
1. An assembly machine comprising:
a turret having a surface disposed in a plane, said turret being rotatable about an axis;
means for indexing said turret about said axis;
means for intermittently energizing said turret indexing means;
a movable shaft coaxial with said axis;
a first plate mounted to said shaft and adapted to move with said shaft, said first plate disposed in a plane generally parallel to the plane of said turret and being movable relative to said turret; and
means which are mechanically independent of said indexing means and said intermittent energizing means, for driving said shaft in synchronism with the indexing of said turret thereby moving said first plate relative to said turret.

**4,313,261**

## NUT INSTALLATION APPARATUS

**Harold A. Ladouceur, Livonia, Mich., assignor to Multifastener Corporation, Detroit, Mich.**

**Filed Jan. 11, 1980, Ser. No. 111,452**
**Int. Cl.³ B23P *19/04*; B23Q *7/10***
**U.S. Cl. 29—798** **3 Claims**



1. A clinch nut installation apparatus for installing generally rectangular nuts in a panel, said nuts including a pilot portion having a generally rectangular end fact, a bore extending through said pilot portion end face perpendicular thereto, laterally extending flanges on opposite sides of said pilot portion and panel receiving grooves located between said flanges and said pilot portion, said installation apparatus including a plunger passage extending through an open end of said passage, said plunger passage receiving said nuts for installation in a panel opposite said passage open end, a plunger means reciprocating in said passage, said plunger means transferring nuts received within said passage out through said open passage end into engagement with a panel opposite said passage, said plunger passage having walls generally conforming to the rectangular cross section of said nuts including end walls and side walls conforming to said nut flange portions, the improvement comprising aligned explosion relief channels communicating with said open end, through said passage end walls, said explosion relief channels adapted to receive said nut flange portions when fractured from the pilot portion, said channels each having opposed side walls and a bottom wall generally perpendicular to said passage, one of said side walls of each channel generally alinged with a side wall of said rectangular passage and the opposed said side wall of each channel off-set inwardly from the opposed side passage wall, defining opposed corners in which said channels such that the width of said explosion relief channels is less than the width of the nut flanges, whereby flange portions fractured from said pilot portions are rotated and expelled outwardly through said channels without jamming in said passage.

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**4,313,262**

## MOLYBDENUM SUBSTRATE THICK FILM CIRCUIT

**Norman S. Barnes, Whitesboro, and Rodman A. Mogle, Clinton, both of N.Y., assignors to General Electric Company, Utica, N.Y.**

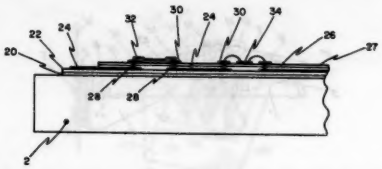
**Filed Dec. 17, 1979, Ser. No. 103,984**
**Int. Cl.³ H05K *3/34***
**U.S. Cl. 29—840** **6 Claims**

1. A method of making a large area multilayer printed circuit structure comprising:
a. providing a substrate material made of molybdenum;
b. screen printing a first layer of dielectric material and allowing said dielectric to dry;
c. firing said first dielectric layer;
d. repeating steps b and c until the desired number of dielec-

tric layers have been printed, said dielectric layers having an uppermost dielectric layer with a top surface;

e. screen printing a first conductor circuit over the top surface of the uppermost dielectric layer and allowing said first conductor to dry;

f. firing said first conductor, said first conductor having a top surface;




g. screen printing a second layer of dielectric material over the top surface of said first conductor and the uppermost layer of said first dielectric layers and allowing said second dielectric layer to dry;

h. firing said second dielectric; and

i. repeating steps e, f, g and h until the desired number of dielectric-conductor layers have been printed.

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**4,313,263**

## METHOD AND APPARATUS FOR USE IN CO-ORDINATE MEASURING MACHINES

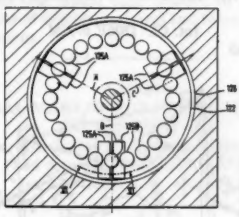
**David R. McMurtry, Wotton-Under-Edge, England, assignor to Rolls Royce Limited and Renishaw Electrical Limited, both of, England**

**Division of Ser. No. 872,312, Jan. 25, 1978, Pat. No. 4,168,576. This application Aug. 17, 1979, Ser. No. 67,554**

**Claims priority, application United Kingdom, Feb. 7, 1977, 5010/77**

**Int. Cl.³ G01B** *5/03, 7/03*

**U.S. Cl. 33—174 L** **6 Claims**




3. An indexing device comprising two members and having an axis, one of the members having a group of at least three first support elements arranged about said axis, the other member having a group of only three second support elements arranged about said axis, the members being relatively rotatable about said axis to establish alignment between said three second elements and a selected three of the first elements, the first elements having seat surfaces, the second elements having seat surfaces confronting the seat surfaces of the first elements when the alignment is established, the members being movable relatively axially to establish engagement between confronting ones of said surfaces of the first and second elements, the surfaces of the elements of one of said groups defining pairs of convergent surfaces on which the surfaces of the elements of the other group are seatable during the engagement thereby to locate the members positively one on the other and determine the angular and radial relationship of the members, and the surfaces of the elements of one of said groups are straight at least substantially radially in respect of said axis and the surfaces of the elements of the other group are convex in two planes which are perpendicular to each other.

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**4,313,264**

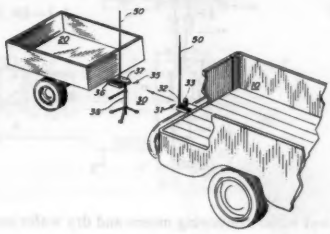
## ALIGNMENT AND COUPLING OF VEHICLES

**Franklin H. Miller, Sr., P.O. Box 30, Stillvalley Rd., Phillipsburg, RD 1, N.J. 08865**

**Continuation of Ser. No. 804,557, Jun. 7, 1977, abandoned. This application Jul. 11, 1979, Ser. No. 56,528**

**Int. Cl.³ G01C** *15/00*

**U.S. Cl. 33—264** **10 Claims**




1. Apparatus for aligning two initially non-aligned vehicles having a coupling or tongue on at least one of the vehicles, comprising

an indicator unit on each vehicle, each unit being formed by a housing containing at least two telescopically extensible segments, including a base tubular segment that is hingeably positioned in said housing, and a tip segment;

and means for mounting the housings with their longitudinal axes spaced equally from the same side of the longitudinal axis of the vehicles on which they are mounted.

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**4,313,265**

## PROCESS FOR PREPARING MICROPOROUS STRUCTURED SOLUBLE COFFEE PRODUCT

**Daniel E. Dwyer, Jr., Long Valley, N.J., assignor to General Foods Corporation, White Plains, N.Y.**

**Filed Apr. 10, 1980, Ser. No. 139,060**

**Int. Cl.³ A23F** *5/32, 5/46*

**U.S. Cl. 34—5** **6 Claims**

1. A process for preparing a microporous structured freeze-dried coffee product comprising:

(a) prechilling a metal plate in a liquid refrigerant maintained at a temperature of −195° to −73° C.;

(b) quickly immersing the plate in an aqueous extract or solution of coffee solids where a thin layer of the extract adheres to and becomes frozen on the plate;

(c) reimmersing the plate, on which the frozen coffee extract is adhering in said liquid refrigerant;

(d) removing the frozen extract from the plate and collecting the frozen extract in the form of flakes;

(e) grinding the flakes to produce particles; and

(f) freeze-drying the frozen extract particles.

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**4,313,266**

## METHOD AND APPARATUS FOR DRYING WAFERS

**Johann Tam, Santa Clara, Calif., assignor to The Silicon Valley Group, Inc., Santa Clara, Calif.**

**Filed May 1, 1980, Ser. No. 145,867**

**Int. Cl.³ F26B** *5/08*

**U.S. Cl. 34—8** **15 Claims**

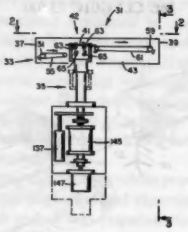
1. Apparatus for drying moisture from a wafer in a way to prevent stains on the sides of the wafer after the wafer has been washed on both sides, said apparatus comprising,

wet wafer conveying means for conveying a wet wafer to a drying station,

dry wafer conveying means for conveying the dry wafer away from the drying station,

wafer holder means for holding the wafer by gripping the wafer on the edges of the wafer at the drying station, said wafer holder means being rotatable during a spin-drying operation and effective to grip the wafer only on the edge of the wafer during the spin-drying operation,

positioning means for lowering the wet wafer holder below



the wet wafer conveying means and dry wafer conveying means,

rotating means for rotating the wafer holder means and wafer to spin-dry the wafer while the wafer is below the wet wafer conveying means and dry wafer conveying means,

and wherein said positioning means are effective to raise the dry wafer to the level of the dry wafer conveying means after the wafer has been spin dryed by the rotating means.

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**4,313,267**

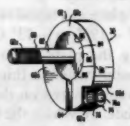
**THERMAL INSULATION END PANEL ASSEMBLY FOR A PAPER MACHINE DRYER CYLINDER AND STUD CLAMP THEREFOR**

**Fred H. Alexy, Glen Falls, N.Y., assignor to AMG Industries, Inc., Glens Falls, N.Y.**

**Division of Ser. No. 81,239, Oct. 2, 1979, Pat. No. 4,241,518. This application May 7, 1980, Ser. No. 147,648**

**Int. Cl.³ F26B *13/04***

**U.S. Cl. 34—108** **2 Claims**



1. A stud clamp for clamping an element carried thereby to a protruding bolt head or the like, said stud clamp comprising:

an arcuate clamping body bearing a circular opening on the order of the bolt head diameter for receiving said bolt head and bearing a radial slot opening radially outwardly from said circular opening to form two body halves,

a screw threadably coupling opposite sides of said body at said slot permitting an increase or reduction in diameter of the circular opening by forcing opposed clamping body halves at said slot to move towards and away from each other to releasably clamp said bolt head to said body, and

a stud fixed to said body at one side thereof overlying said circular opening and projecting axially of said circular opening and away from said circular opening for coupling of said stud clamp to said element.

**4,313,268**

**STRETCHING AND FOLDING APPLIANCE**

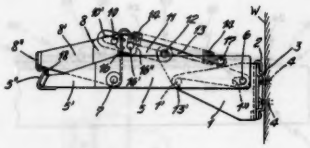
**Hermann Fritschi, Steinmürli, CH-8503 Hüttwilen, Switzerland**

**Filed Feb. 20, 1980, Ser. No. 122,933**

**Claims priority, application Switzerland, Mar. 2, 1979, 2050/79**

**Int. Cl.³ D06F *71/40*; D06C *3/08***

**U.S. Cl. 38—12** **16 Claims**



1. In a stretching and folding appliance having clamp elements pivotable on a bracket for clamping in the workpiece, and toggle levers in working connection with these elements, which by springs about a spring tipping point hold and press the clamping elements into the clamping position, the provision of the one pivotable clamp arm being also displaceably mounted in the bracket and means are provided to secure the clamp arms in the tightened and closed position and elements are provided for the adjustment of the clamp strips which define an insertion opening.

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**4,313,269**

**FEEDING MACHINE FOR SHEETS**

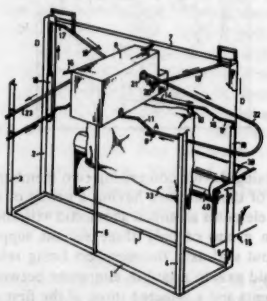
**Jacob van Rumpt, Vught, and Martinus T. Vorstenbosch, Den Dungen, both of Netherlands, assignors to Amko B.V., Kerkdriel, Netherlands**

**Filed Mar. 8, 1979, Ser. No. 18,663**

**Claims priority, application Netherlands, Mar. 9, 1978, 7802582**

**Int. Cl.³ D06F *67/04***

**U.S. Cl. 38—143** **19 Claims**



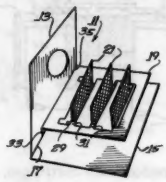
1. Inserting machine, destined to stretch and lay down washed sheets and the like articles, suspended in clamps in a hang-out station, on a feed device of a mangle, characterized in that the clamps (9) are secured to carts (26) which are guided by means of driving members (11,13) along a continuous path having successive stations (A or G, 8, and B through F), said carts moving to a cart spread station (C) and then returning after stretching each time to a central store (8), the sheet, after being stretched (C), being taken over by a loading system (15) which feeds the sheet to a mangle.

**4,313,270**

## ITEM WITH PIVOTING POP-UP

**John K. Volkert, Northfield; Ib Penick, Prospect Heights, and Robert B. Volkert, Wilmette, all of Ill., assignors to Compak Systems, Inc., Northfield, Ill.**

**Filed May 28, 1980, Ser. No. 153,931**
**Int. Cl.³ G09F *19/00***
**U.S. Cl. 40—124.1** **14 Claims**



**1.** An item of the character described comprising
a first basepiece,
a second basepiece joined to said first basepiece so as to pivot relative to each other along a vertical line,
a die-cut panel having a front surface and a rear surface disposed between said first and second basepieces, said panel having formed therein at least one subpanel,
said subpanel having upper and lower extensions each of which has a pair of substantially parallel lateral edges and said subpanel being connected to the remainder of said die-cut panel only by vertical hinge lines formed respectively along one said lateral edge of each of said extensions,
hinged tabs carried by said other lateral edge of each of said extensions,
means attaching each of said tabs to said first basepiece, and
means interconnecting said remainder of said die-cut panel and said second basepiece so that opening of said item by pivoting one of said basepieces about said vertical line relative to the other causes said subpanel to simultaneously pivot about said vertical hinged connections at each said one lateral edge relative to the plane of the remainder of said die-cut panel and become oriented edgewise thereto.

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**4,313,271**

## ANIMAL MARKER FOR PREVENTING MILK CONTAMINATION

**LeRoy Bauer, Rte. 2, Box 54, Shakopee, Minn. 55379**

**Filed Aug. 18, 1980, Ser. No. 179,179**
**Int. Cl.³ G09F *3/00*; A01K *11/00***
**U.S. Cl. 40—304** **5 Claims**

**1.** A marker to be used in marking milk producing animals to reduce the likelihood of contaminated milk from reaching the market, said marker comprising a marker body having a securing means for attaching the marker to the body of the animal in a position in close proximity to the animal's udder, said marker is elongated and includes a rearward section having said securing means located thereon and a forward anteriorly projecting section which extends toward the front of the animal from the rearward section and is located in close proximity to the animal's udder, the udder being positioned generally medially thereof when the marker is secured to the animal's leg.

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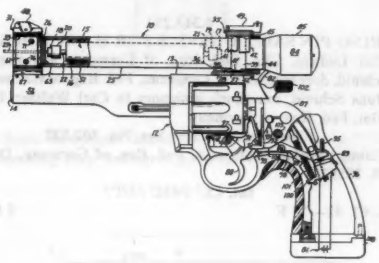
**4,313,272**

## LASER BEAM FIREARM AIM ASSISTING METHODS AND APPARATUS

**John W. Matthews, Fountain Valley, Calif., assignor to Laser Products Corporation, Fountain Valley, Calif.**

**Filed Apr. 25, 1979, Ser. No. 33,284**
**Int. Cl.³ F41G *1/34***
**U.S. Cl. 42—1 A** **85 Claims**



**1.** In a method of assisting the aiming of a firearm with a light beam from a laser, the improvement comprising in combination the steps of:
locating said laser in a tubular member for emission of said light beam through an end of said tubular member;
mounting said tubular member at a first location with only linear freedom of movement relative to said firearm; and
mounting said tubular member at a second location with only angular freedom of movement relative to said firearm.

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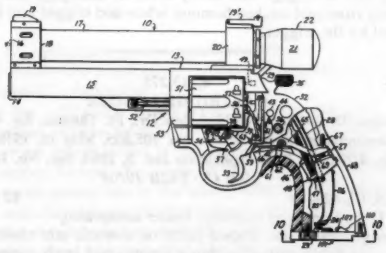
**4,313,273**

## FIREARMS AND LASER BEAM AIM ASSISTING METHODS AND APPARATUS

**John W. Matthews, Fountain Valley, and Michael J. Fraer, Sierra Madre, both of Calif., assignors to Laser Products Corporation, Fountain Valley, Calif.**

**Filed Apr. 25, 1979, Ser. No. 33,285**
**Int. Cl.³ F41G *1/34***
**U.S. Cl. 42—1 A** **41 Claims**



**11.** In a firearm, the improvement comprising in combination:
a firing device;
means including a trigger and a manually cockable and selectively releasable hammer for actuating said firing device;
activable means for providing when activated an aiming mark on a target;

a switch for activating said activable means;

control means for said switch coupled to said trigger for inhibiting activation of said activable means in a rest position of said trigger;

means coupled to said switch control means and to said hammer for starting activation of said aiming mark providing means through manual cocking of said hammer to provide said aiming mark, including means for decoupling said switch control means from said trigger in response to cocking of said hammer; and

means including said trigger for releasing said cocked hammer into actuation of said firing device only after activation of said aiming device and provision of said aiming mark.

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**4,313,274**

## FIRING PIN SAFETY DEVICE FOR HAND FIREARMS

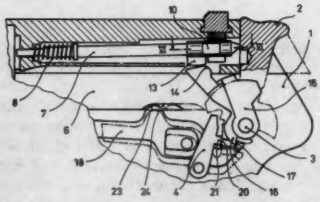
**Walter Ludwig, Ulm, Fed. Rep. of Germany, and Franziska Schmid, deceased, late of Langenau, Fed. Rep. of Germany (by Hans Schmid, executor), assignors to Carl Walther GmbH, Ulm, Fed. Rep. of Germany**

**Filed Dec. 11, 1979, Ser. No. 102,527**

**Claims priority, application Fed. Rep. of Germany, Dec. 21, 1978, 2855224**

**Int. Cl.³ F41C *17/C*;**

**U.S. Cl. 42—70 F** **5 Claims**



1. In a firing pin safety device for hand firearms, an axially displaceable firing pin, means for securing said firing pin against axial movement, means including a release lever for releasing said firing pin from said securing means to enable said firing pin to be displaced axially, a hammer pivotable between a cocked position and a firing position, a safety lever engageable with said hammer to retain said hammer in a cocked position, a trigger arm acuated by a trigger, and a first abutment on said trigger arm to engage said release lever to disengage said securing means and a second abutment on said trigger arm to engage said safety lever to disengage said safety lever from said cocked hammer when said trigger arm is actuated by the trigger.

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**4,313,275**

## CARTRIDGE LOADER

**Robert D. Switzer, 149 Highview Dr., Ft. Thomas, Ky. 41075**

**Continuation-in-part of Ser. No. 905,855, May 15, 1978, Pat. No. 4,202,124. This application Jan. 3, 1980, Ser. No. 109,286**

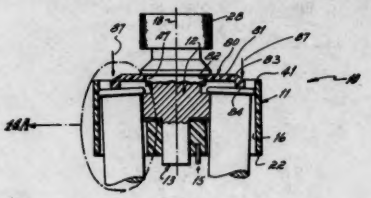
**Int. Cl.³ F42B *39/04***

**U.S. Cl. 42—89** **12 Claims**

1. An improved cartridge loader comprising

a generally star shaped latch on a shaft, said shaft being rotatably carried within a casing, said latch cooperating with a plurality of cartridge bores defined by said casing and positioned circumferentially around said latch, said latch being selectively movable between a capture position at which cartridges are latched in temporarily stored relation with said loader and a release position at which cartridges temporarily stored within said loader are released therefrom, and

a resilient bore closure member seated on said shaft and rotatable relative thereto, said bore closure member being comprised of a plurality of resilient protective arms each of which is at least partially received within a casing bore, each of said protective arms including a contact surface adapted to cooperate with a cartridge's end flange when



said loader is loaded with cartridges, and at least one of said protective arms being of a width that prevents substantial rotation of said closure member relative to said casing as said latch moves between said capture and release positions.

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**4,313,276**

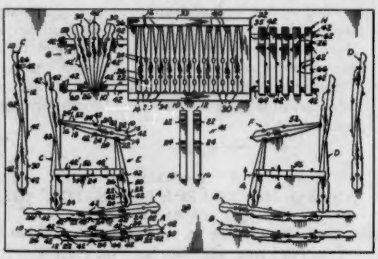
## TOY CHAIR CONSTRUCTION KIT

**Robert J. Fleming, 813 SE. 60, Oklahoma City, Okla. 73149**

**Filed Apr. 10, 1980, Ser. No. 138,954**

**Int. Cl.³ A63H *33/00, 3/52;* B60G *11/02***

**U.S. Cl. 46—16** **3 Claims**



1. In a toy chair forming kit in combination with a plurality of clothespins, each clothespin being characterized by a pair of separable elongated wooden pin elements rectangular in transverse section with each pin element further characterized by a head end, a lever end and coextensive front and back surfaces, the front and back surfaces each having at least one transverse indentation intermediate its ends, the improvement comprising: a planar rigid workboard having an upper surface;

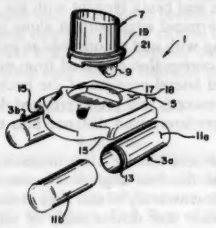
means including side and end members on the workboard upper surface forming an upwardly open rectangular area for encompassing the perimeter of a plurality of juxtaposed pairs of the pin elements when arranged by pairs in back-to-back surface contiguous contact; and,

at least one group comprising a plurality of upstanding rods, supported in spaced-apart relation by the workboard remote from the rectangular area and arranged in a predetermined pattern defining the perimeter of a plurality of juxtaposed or abutted pin elements when disposed on the workboard defining one chair side subassembly including front and back legs, a chair arm and chair legs cross brace of a toy chair.

## 4,313,277
## FLOATABLE TOY

Ronald R. Klawitter, Hermann, Mo., assignor to Steven Manufacturing Company, Hermann, Mo.

Filed Oct. 1, 1979, Ser. No. 80,388
Int. Cl.³ A63H 23/06
U.S. Cl. 46—95 2 Claims



1. A floatable toy having a pair spaced, water-tight hollow floatable hulls extending in generally longitudinal direction relative to the toy, a support deck secured to and extending between the upper surface of said hulls above the level of the water when the toy is floating on the surface of the water, said support deck having a generally horizontal surface with an opening therein, a one-piece container having a reservoir portion for holding a supply of water above the level of the water on which the toy is floating and a discharge nozzle extending down from said reservoir portion of the container below the surface of the water, said discharge nozzle having an opening below the surface of the water for the discharge of the water contained in the reservoir portion of the container under the hydrostatic pressure of the water in the reservoir portion of the container in generally horizontal direction to impart a propelling force to said toy, said container having an integral flange extending generally circumferentially therearound and a plurality of integral lugs spaced axially below said flange, said lugs being insertable through said opening in said support deck and cooperating with said flange whereby a portion of said support deck defining said opening is held captive between said adjacent inner faces of said lugs and said flange with the inner face of said flange constituting a bearing surface permitting manual rotation from above of said container together with said nozzle relative to said support deck about a generally vertical axis whereby the propelling force may be selectively directed in any desired direction relative to said toy for steering the toy in any desired direction.

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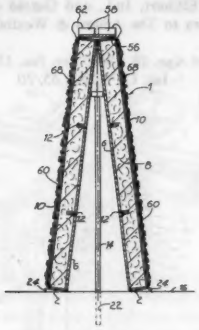
## 4,313,278
## MUSHROOM GROWING

Roy A. W. Pointing, Wokingham, and Richard A. Rucklidge, Angmering, both of England, assignors to W. Darlington & Sons Limited, Hayes, England

Filed Jul. 20, 1979, Ser. No. 59,429
Claims priority, application United Kingdom, Jul. 28, 1978, 31452/78
Int. Cl.³ A01G 1/04
U.S. Cl. 47—1.1 16 Claims

1. A method of growing mushrooms comprising filling a horizontal tray with compost mixed with mushroom spawn, covering the compost with a layer of casing medium, supporting the tray in a horizontal disposition under growing conditions until the mycelium of the spawn has fully colonized the casing medium which is thereby consolidated, then supporting the tray on one end in a more generally vertical disposition under mushroom growing conditions so that the mushrooms



grow from the upright face of the consolidated casing medium, and watering only the top edge of the casing medium.

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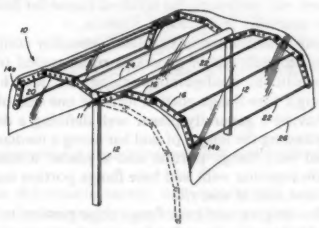
## 4,313,279
## AGRICULTURAL SYSTEM WITH ARTICULATED MEMBERS

George Greenbaum, 790 Boylston St., Boston, Mass. 02199

Continuation-in-part of Ser. No. 101,499, Dec. 10, 1979. This application Feb. 4, 1980, Ser. No. 118,547
Int. Cl.³ A01G 9/00
U.S. Cl. 47—29 3 Claims



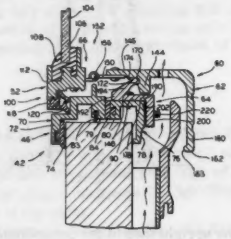
1. An agricultural system which comprises:
(a) at least two longitudinal vertical supports in spaced-apart parallel relationship;
(b) two articulated arches secured to each support at the upper portion thereof, the arches defining a V-shaped recess where joined to the vertical support, each of the arches formed of a plurality of uniform apertured segments pinned one to the other, including a first segment and a last segment, the first segment of each arch pinned to the vertical support, each arch adapted to extend from a first open position where the last segment engages the ground, to a closed position where the last segment is adjacent to the upper portion of the vertical support;
(c) a plurality of longitudinal rod-like horizontal supports in parallel relationship perpendicularly received in the apertures of the segments; the vertical supports, the arches and the horizontal supports forming a skeletal structure; and
(d) flexible sheet material secured to the structure on the outer surface thereof to define an enclosed atmosphere.

4,313,280

## QUICK OPENING LATCH ARRANGEMENT FOR HINGED VEHICLE WINDOWS

Yale W. Ehret, Elkhart, Ind., and Gerald C. Kasner, Union, Mich., assignors to The Adams & Westlake Company, Elkhart, Ind.

Filed Apr. 10, 1980, Ser. No. 138,912
Int. Cl.[3] E05B 65/10
U.S. Cl. 49—141 10 Claims



1. In a window construction including a window frame mounted in a vertical wall and forming a generally quadrilateral window opening in the wall defining upper and lower generally horizontal window opening edges, and a sash frame assembly of a size to close the window opening when aligned with and disposed in same and including a sash frame proportioned to complement the window opening and transparent panel means mounted in the sash frame for closing the window opening when the sash frame assebmly is in its closed position, said sash frame including a first sash rail portion pivoted to said window frame for swinging movement of the sash frame assembly outwardly of the window opening to open the window opening, said sash frame including a lower rail portion formed to seal off the window opening at the window opening lower edge, and a latch assembly for releasably latching the sash frame lower rail portion to the window frame for holding the sash frame assembly in its closed position,

the improvement wherein said latch assembly comprises:

an elongate latch bar of generally right angled transverse cross-sectional configuration along the length thereof defining a base flange portion forming one side of said bar and having a generally planar web defining a depending rib extending the length of said bar along a median portion of said base flange portion and a planar terminal edge portion coplanar with said base flange portion and spaced from one side of said rib,

means for hinging said base flange edge portion to the sash assembly lower rail portion for pivotal movement about a horizontal axis disposed at the level of the sash assembly lower rail portion,

said bar configuration defining a depending flange portion on the other side of said rib and spaced therefrom,

said latch assembly further comprising an elongate keeper member secured to the window frame along the lower edge of same,

said keeper member comprising:

a keeper bar having a base flange forming one side of the keeper bar and underlying said latch bar base flange portion in the latched position of the latch assembly,

said keeper bar base flange portion having integral therewith a keeper thrust flange portion along its outer side edge that is angled upwardly and inwardly of the window opening an acute angle surmounted with a horizontal rectilinear bead of cylindrical configuration defining a central axis that is below the level of and is spaced inwardly of said hinging means axis in said latched position of the latch assembly,

said bead exceeding semi-cylindrical shaping in circumference,

said bead axis being spaced inwardly of the window opening a predetermined distance from said hinging means axis in said latched position of the latch assembly,

said latch bar base flange along said one side of said rib defining a concave latching seat of cylindrical configuration struck about an axis that is at said predetermined distance from said hinging means axis in said latched position of the latch assembly,

said latch bar seat being tangent with the underside of said latch bar terminal edge portion along one edge of same and defining with said rib one side an external snap action rectilinear corner that is spaced from said hinging means axis, in said lateral position of the latch assembly, a distance that exceeds said predetermined distance but is less than said predetermined distance plus the radius of said bead,

said latch bar seat having a circumference that is on the order of one hundred degrees in circumference,

said rib side downwardly of said snap action corner defining a cam surface that downwardly of said latch bar base flange portion converges toward the plane of said latch bar depending flange portion,

said keeper bar bead axis being elevational positioned relative to said hinging means axis such that said latch bar base flange portion is horizontally disposed and said latch bar depending flange portion is vertically disposed when said keeper bar bead is seated in said latch bar seat,

said latch bar depending flange portion extending below the level of said seat axis a distance that exceeds said predetermined distance, and provides a lever for upwardly swinging of said latch bar about said hinge means axis that is on the order of twice said predetermined distance.

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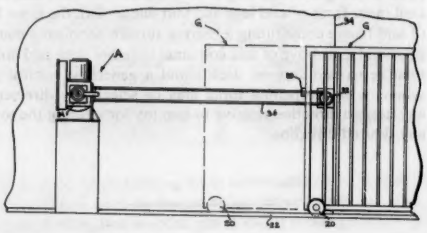
4,313,281

## GATE OPENING AND CLOSING APPARATUS AND METHOD

Moscow K. Richmond, 2819 Butler Ave., Los Angeles, Calif. 90064

Filed Mar. 3, 1980, Ser. No. 126,316
Int. Cl.[3] E05F 15/00
U.S. Cl. 49—280 37 Claims



1. An apparatus for shifting a gate from a closed position to an open position and from the open position to the closed position with respect to an access opening, said apparatus comprising:

(a) a housing,

(b) motive means associated with said housing,

(c) a drive member operatively connected to said motive means and capable of being connected to a gate for causing shifting movement of same,

(d) a locking mechanism operatively associated with said drive member and being in engagement with said drive member to prevent same from causing shifting movement of said gate when said motive means is not energized and to prevent shifting movement of said gate even from manual attempt to move said drive member, said locking mechanism also being opened and unengageable with said drive member when said motive means is energized to

permit movement of said gate when said motive means is energized, and

(e) a manually operable release member operatively connected to said locking mechanism and to said drive member, said release member being effective to prevent engagement between said locking mechanism and said drive member so that said locking member does not prevent shifting movement of said gate, said release member also being simultaneously operable to prevent said drive member from being operable by said motive means when said release member is actuated to thereby override said apparatus and permit easy manual shiftable movement of said gate.

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**4,313,282**

## WINDOW CRANK ASSEMBLY

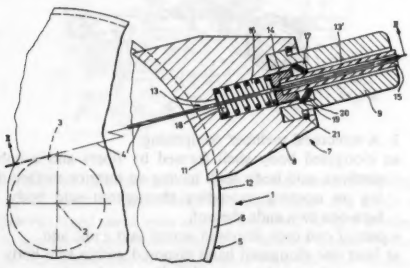
**Edmund Hagemann, Wolfsburg, and Herbert Wildschütte, Brunswick, both of Fed. Rep. of Germany, assignors to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany**

**Filed Nov. 13, 1979, Ser. No. 93,928**

**Claims priority, application Fed. Rep. of Germany, Nov. 15, 1978, 2849445**

**Int. Cl.³ E05F *11/48***

**U.S. Cl. 49—352** **11 Claims**



1. In a window crank assembly for raising and lowering a window pane, including a stationarily supported cable drum having a core; a housing accommodating the cable drum and having an opening; a cable slung about the core and passing through the opening and being connected to the window pane; drive means for rotating the core for exerting a pulling force on the cable; a cable conduit accommodating a length portion of the cable and having opposite ends; first and second fittings supporting opposite ends of the cable conduit; at least the first fitting being arranged in the vicinity of the cable drum at a predetermined distance from the core; the improvement comprising a guide segment member supporting said first fitting against pressing forces exerted thereon by said cable conduit; said first fitting being swingably arranged on said guide segment member for motion in a predetermined plane; said opening in said housing comprising a slot extending parallel to said plane, whereby freedom of lateral motion of said cable is provided for following any swinging motion of said first fitting.

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**4,313,283**

## SHARPENER FOR INDUSTRIAL KNIFE BLADES

**Leward N. Smith, Milbrook at Coldwater Rd., Remus, Mich. 49430**

**Filed Sep. 27, 1979, Ser. No. 79,353**

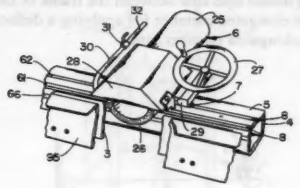
**Int. Cl.³ B24B *3/55, 7/02***

**U.S. Cl. 51—56 R** **27 Claims**

1. A sharpener for industrial knife blades comprising:

a main frame including means for releasably retaining a knife blade in a fixed relationship therewith, and an elongate beam having a way surface; said way surface being substantially planar and inelastically deformable;

grinding means for sharpening a cutting edge of the knife blade; said grinding means having rollers which are abuttingly supported on the way surface and slideably mount the grinding means on the beam for translation thereon along a plane substantially parallel with said knife blade cutting edge; and



means urging said rollers and said beam together, whereby repeated translation of said grinding means along said beam causes said rollers to impress a concave track in said way surface, wherein said rollers are retained and guided for accurate grinding of the knife blade.

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**4,313,284**

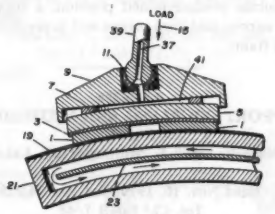
## APPARATUS FOR IMPROVING FLATNESS OF POLISHED WAFERS

**Robert J. Walsh, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.**

**Filed Mar. 27, 1980, Ser. No. 134,714**

**Int. Cl.³ B24B *7/04***

**U.S. Cl. 51—131.4** **5 Claims**



1. Apparatus for improving polished wafer flatness comprising:

a thin deformable carrier disc mounted to a resilient ring which is mounted to a rotable pressure plate, said pressure plate, resilient ring, and first carrier surface forming a chamber, said chamber in communication with a vacuum means for deforming said carrier disc into an inwardly convex shape toward the chamber; said deformed carrier having wafers mounted on a second surface which is concave; said wafers rotably engageable with a polishing pad mounted turntable having an internal cooling means for disapating heat from the polishing pad and first surface of the turntable, the turntable second surface being cooler than the first surface during polishing resulting in a thermal bow of the turntable toward the second surface.

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**4,313,285**

## STABILIZING DEVICE

**Bertil Jonasson, Box 45, S-340 22 Eneryda, Sweden**

**Filed Apr. 21, 1980, Ser. No. 142,501**

**Claims priority, application Sweden, Apr. 25, 1979, 7903613**

**Int. Cl.³ B24B *21/00***

**U.S. Cl. 51—135 R** **6 Claims**

1. A belt sanding machine, comprising,

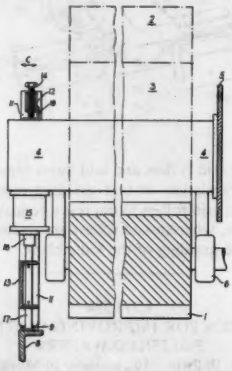
a frame,

a contact drum for receiving a sanding belt and holding it against a workpiece during operation of the machine,

an elongated member supporting said contact drum,

said elongated member having one end permanently fastened to the frame of the machine,

actuating means operable between the frame of the machine and the elongated member for applying a deflection force to the elongated member, and



stop means attached to the machine frame for preventing excessive deflection of the elongated member by said actuating means, said stop means and said actuating means being operable to fix and stabilize the elongated member at an accurate predetermined position, a support member which carries said stop means and is pivotally connected to said frame.

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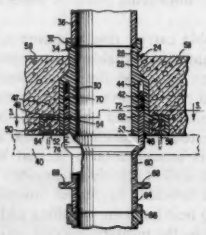
**4,313,286**

## PIPE SUPPORT COUPLING AND METHOD OF USING SAME

**Gerold J. Harbeke, 2807 S. Military Trail, Lake Worth, Fla. 33463**

**Filed Nov. 16, 1979, Ser. No. 94,928**
**Int. Cl.³ E04B 5/48**
**U.S. Cl. 52—220** **10 Claims**



1. A device adapted to be embedded in the masonary floor of a building structure for supporting piping in connected relationship thereto, either connected thereto at the ends thereof or extending therethrough, said device comprising:

(a) a substantially rigid unitary member including a continuous wall defining a first tubular portion having a first end and a second end, said first tubular portion having a concentric, spaced-apart sleeve formed integrally therewith extending to said second end to form a recess between said first tubular portion and said sleeve, and a second tubular portion having one end thereof slidably mounted in said recess in sealing engagement with said sleeve, and the other end thereof adapted to be joined to one end of said piping, and

(b) anchor means integrally formed with said unitary member and extending radially outward therefrom, said anchor means being substantially surrounded by said masonry floor to maintain said unitary member in position relative to said floor.

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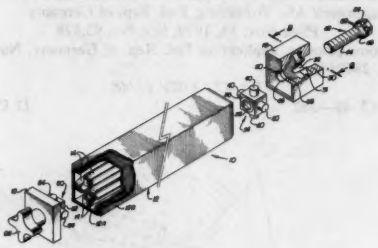
**4,313,287**

## INTERNALLY TENSIONED STRUCTURAL MEMBER AND METHOD OF ASSEMBLING SAME

**Byron A. Romig, Jr., 3920 Eagle Rock Blvd., Los Angeles, Calif. 90065**

**Filed Jan. 25, 1980, Ser. No. 115,502**
**Int. Cl.³ E04C 3/10**
**U.S. Cl. 52—223 R** **21 Claims**



1. A structural member comprising:

an elongated body shell formed by fibers and a bonding medium, said body shell having an interior surface defining an opening extending throughout said body shell between two ends thereof;

a pair of end caps disposed across said ends; and

at least one elongated band disposed within said body shell connecting said caps and pulling said end caps toward each other and against said body shell, said band contacting said interior surface substantially throughout the length thereof, thereby strengthening and rigidifying said body shell.

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**4,313,288**

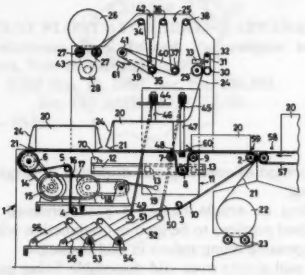
## MACHINE FOR PACKAGING VARIOUS ARTICLES BETWEEN TWO JUXTAPOSED PLASTICS MATERIAL SHEETS

**Lamberto Tassi; Gianni Tosarelli, and Aris Ballestrazzi, all of Vignola, Italy, assignors to Sitma - Societa Italiana Macchine Automatiche S.p.A., Spilamberto, Italy**

**Filed Jun. 12, 1979, Ser. No. 47,692**
**Claims priority, application Italy, Jun. 13, 1978, 24510 A/78**
**Int. Cl.³ B65B 57/12, 9/02**
**U.S. Cl. 53—74** **1 Claim**

1. A machine for packaging sundry articles between juxtaposed sheets of a plastics material, comprising a conveyor belt movable along a working path of horizontal orientation for carrying a bottom sheet fed on said conveyor belt along said working path to receive the articles to be packaged, means for feeding a top sheet above the article to be packaged along said working path and a welding unit situated above the top sheet and capable of being lowered until engaging a counterwelding unit positioned beneath the bottom sheet to perform a double-seam welding transversally of the sheets with a severing cut therebetween, at every interval between an article and its next, characterized in that for the feed of the top sheet there is provided a feeding unit including a payoff drum, means for controllably driving said drum, a feeding roller, means for controllably driving said feeding roller, a pressure roller, means for moving said pressure roller toward and away from said feeding roller so as to selectively clamp and release the top

sheet, a succession of idle rollers inserted between said drum and said feeding roller to provide a series of alternate sheet loops in said top sheet, means for shifting at least one of said idler rollers relative to the adjoining rollers and in a direction away from the top sheet to define a freed sheet span, said succession of rollers including an additional roller yieldably urged toward a normal working position which is adapted to form a sheet loop and which is withdrawable from its normal working position as a consequence of a pull exerted on the top sheet, means for lowering and raising said welding unit toward and away from said counterwelding unit, and a control system including first means responsive to the arrangement of the articles to be packaged in a preselected position for actuating (a) the withdrawal of said pressure roller from said feeding roller so as to release the top sheet from said feeding roller whereby the sheet span is freely withdrawable by said welding



unit whenever said unit drops toward said counterwelding unit, (b) the shift of said at least one idler roller in a mode to provide the freed sheet span and (c) lowering of said welding unit toward said counterwelding unit, second means responsive to the attainment of engagement between said welding unit and said counterwelding unit for subsequently actuating (a) engagement of said pressure roller with said feeding roller, (b) driving of the latter and (c) gradual shifting of said at least one idler roller in an opposite mode toward the sheet and into contact with the sheet to exert a withdrawing pull on the top sheet so that subsequent movement of said roller away from the freed sheet will form a sheet span, and third means for actuating said drum in a sheet payoff direction in response to the shift of said additional idler roller from its normal working position as a consequence of said gradual shifting of said at least one roller in said opposite mode and the actuation of the driving of the feeding roller.

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**4,313,289**

## APPARATUS FOR MANUFACTURING GAS-FILLED BALLS WITH PRECISION

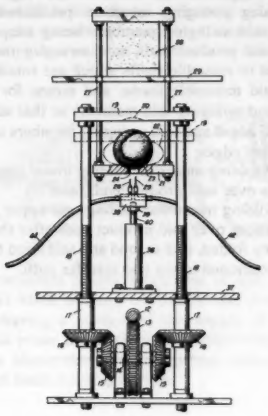
**William D. Birdsong, Jr., 2534 Wessex Lane, Chattanooga, Tenn. 37421**

**Division of Ser. No. 918,718, Jun. 26, 1978, Pat. No. 4,251,073. This application Nov. 13, 1980, Ser. No. 206,351**

**Int. Cl.³ B65B** *31/08*

**U.S. Cl. 53—84** **5 Claims**

1. In an apparatus for manufacturing inflated hollow balls with high uniformity in performance characteristics, a relatively stationary ball rest element on which a ball may be seated, a ball compressing crosshead arranged in opposing relationship to the ball rest element, means to drive said crosshead toward said rest element with a ball positioned between the rest element and crosshead for compressing the ball a predetermined amount, means to inject a sealant and a gaseous inflating medium into the ball compressed between the rest element and crosshead, and a load cell connected with said ball rest element and responding to the force thereon due to the compression of the ball by said crosshead whereby a signal produced by the load cell can control said means to drive said



crosshead and said means to inject a sealant and a gaseous inflating medium into the ball.

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**4,313,290**

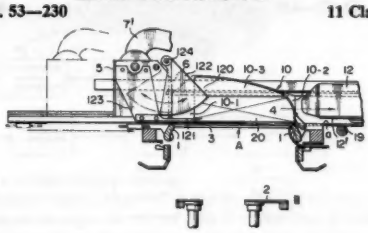
## APPARATUS FOR PACKING

**Michio Furuya, Kashiwa, and Susumu Sakamoto, Tokyo, both of Japan, assignors to Tokyo Automatic Machinery Works, Ltd., Tokyo, Japan**

**Filed Dec. 4, 1979, Ser. No. 100,182**

**Int. Cl.³ B65B** *11/18, 7/02*

**U.S. Cl. 53—230** **11 Claims**



1. Apparatus for packing a product having two opposed ends, two opposed sides, a top surface, and a bottom surface, said apparatus comprising:

(a) a packing sheet lapping section for lapping a packing sheet around said product, said lapping section having a leading and a trailing side, said packing sheet having opposed end portions adapted to extend beyond said opposed ends of said product, each end portion including an upper edge adapted to extend beyond the top product surface, a lower edge adapted to extend beyond the bottom surface of said product and opposed leading and trailing side edges;

(b) a product transfer path located adjacent to said leading side of said lapping section;

(c) a pusher located adjacent to said trailing side of said lapping section, said pusher adapted to move said product along said transfer path;

(d) first folding means located adjacent said trailing side of said lapping section for folding side edges of said packing sheet end portions over said product ends and simultaneously upwardly folding upper edges of said end portions above said top surface of said product, said first folding means comprising at least one generally upright support member mounted on a moveable frame, folding pawls

which extend adjacent to the bottom surface of said product, said folding pawls being mounted on said generally upright support member, said first folding means further comprising swinging members positioned above said pawls, said swinging members being adapted to swing along said product ends, said swinging members being attached to rotatable shafts which are rotatably mounted upon said moveable frame, and means for moving said frame and swinging said members so that said pawls fold said side edges and said swinging members upwardly fold said upper edges;

(e) second folding means for folding lower edges of said end portions over said product ends; and

(f) third folding means for folding said upper edges of said end portions over said product ends after they have been upwardly folded, said second and said third folding means being positioned along said transfer path.

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**4,313,291**

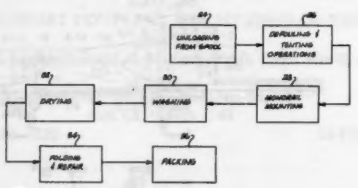
**METHOD FOR REFURBISHING AND PROCESSING PARACHUTES**

**Russell T. Crowell, Titusville, Fla., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Division of Ser. No. 862,878, Dec. 12, 1977, Pat. No. 4,244,810. This application May 30, 1980, Ser. No. 154,663**

**Int. Cl.³ D06F *31/00***

**U.S. Cl. 53—429** **4 Claims**




1. A method for refurbishing and processing a parachute of the type having a canopy including a plurality of gore sections with radial lines delineating between adjacent gore sections extending through a common point to define an apex portion comprising the steps of:

(a) arranging said parachute canopy in a partially-open tented configuration for defouling and inspection thereof;

(b) providing an overhead conveyor;

(c) suspending said parachute horizontally from said conveyor by attaching every nth radial line to said conveyor with said apex portion conveyed forwardmost where n is defined by $n=2G+1$, where G is the desired number of gore section depending from either side of the point of attachment to said conveyor;

(d) providing a washing station wherein said parachute is washed;

(e) providing a drying station wherein said parachute is dried;

(f) providing a folding station wherein said canopy is removed from said conveyor and folded for packing; and

(g) sequentially conveying said parachute canopy suspended from said overhead conveyor in a generally horizontal path to said washing, drying and folding stations.

**4,313,292**

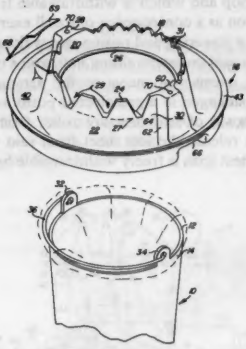
**METHOD AND APPARATUS FOR ENUMERATIVE DISPLAY AND DISPOSAL OF SURGICAL SPONGES**

**Rose M. McWilliams, 1065 S. Josephine, Denver, Colo. 80209**

**Filed Mar. 5, 1979, Ser. No. 17,903**

**Int. Cl.³ B65B *67/04, 67/12***

**U.S. Cl. 53—474** **7 Claims**



1. A method of counting and disposing of surgical sponges comprising:

providing an article having a predetermined number of notched portions to be used in conjunction with a bucket, a disposable lining means in said bucket;

fitting said article over said disposable lining means in said bucket to be supported on a rim of said bucket;

placing one sponge in each of said notch portions until said predetermined number of notch portions each have one sponge; and then

removing sponges from said notch portions and placing them in said disposable lining means.

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**4,313,293**

**CLUTCH-BRAKE DEVICE FOR CUTTING MACHINES**

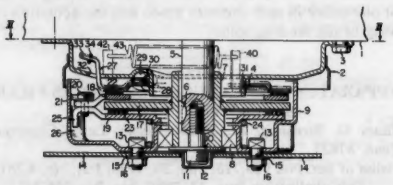
**Shigeo Nagai, Ueda, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Nagano, Japan**

**Filed Sep. 9, 1980, Ser. No. 185,519**

**Claims priority, application Japan, Oct. 18, 1979, 54-134622**

**Int. Cl.³ A01D *69/10***

**U.S. Cl. 56—11.3** **7 Claims**



1. A clutch-brake device for cutting machines comprising: an engine case; a first cover secured to said engine case; an output shaft connected to an engine and projecting outwardly from said engine case through said first cover; a second cover rotatably mounted on said output shaft; a cutting blade secured to said second cover; a disk connected to said output shaft for rotation therewith; a brake and clutch assembly mounted on said output shaft for rotation and axial movement, said assembly including a brake plate and a clutch plate disposed in parallel with each other with said disk interposed therebetween, said brake and clutch plates being connected with each other at their radially outer peripheral portions; a plurality of axial recesses formed in said second cover; a plurality of guide

pieces projecting from said brake and clutch assembly and being in axially slidable but non-rotatable engagement with said recesses in said second cover for driving connection between said brake and clutch assembly and said second cover; first means for urging said brake and clutch assembly into frictional driving engagement with said disk; a brake lever provided on said first cover for rotation and axial sliding movement and disposed between said first cover and said brake and clutch assembly in opposing relation to the latter; and second means for urging said brake lever to rotate relative to said first cover into a released condition so that said brake lever is moved away from said brake and clutch assembly to place the latter into frictional engagement with said disk and at the same time out of engagement with said brake lever; said second cover enclosing said disk, said brake and clutch assembly, and said first means for preventing the entrance of external substances as cut by said cutting blade.

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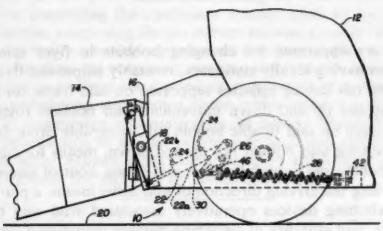
**4,313,294**

## CONSTANT FLOAT ATTACHMENT APPARATUS

**Wayne B. Martenas, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.**

**Filed Sep. 11, 1980, Ser. No. 186,353**
**Int. Cl.³ A01D *35/12, 67/00***
**U.S. Cl. 56—15.8** **6 Claims**



1. Apparatus for lifting and floating attachments on a crop harvesting machine comprising:
- an attachment lift arm connected to a first pivot point on the machine;
- means connected for pivoting the life arm, said means including a fluid operated piston;
- resilient means connected for urging the lift arm into a float position;
- a pivot arm interconnecting the piston and the resilient means, the pivot arm having a first end connected to the piston and having a second end connected to the resilient means, the pivot arm connected to a second pivot point on the machine between the first and second ends of the pivot arm; and
- a stop on the machine for engagement with the second end of the pivot arm.

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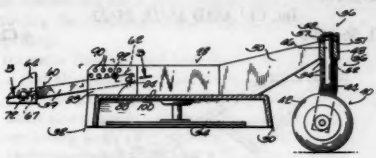
**4,313,295**

## BLADE HOUSING MOUNT FOR RIDING MOWERS

**Loren F. Hansen, and Ronald M. Stolley, both of Lincoln, Nebr., assignors to Outboard Marine Corporation, Waukegan, Ill.**

**Filed Feb. 11, 1980, Ser. No. 120,258**
**Int. Cl.³ A01D *35/26***
**U.S. Cl. 56—15.8** **10 Claims**

1. A riding mower comprising a prime mover having a chassis supported on a rotatable wheel for movement over the ground, a blade housing carrying a cutter blade and having first and second end portions, a ground engaging wheel mounted on said first end portion of said blade housing for partially supporting said blade housing and for gaging the distance above the ground at which said first end portion of said blade housing travels, a push arm having first and second ends, means mounting said first end of said push arm on said prime mover chassis for pivotal movement of said push arm relative to said prime mover chassis about a first generally horizontal axis, and means mounting said second end of said push arm on said blade housing for permitting upward pivotal movement of said second end portion of said blade housing relative to said push arm about a second axis and selectively



preventing downward pivotal movement of said second end portion of said blade housing relative to said push arm and thereby transferring a portion of the weight of said blade housing to said prime mover chassis and controlling the minimum distance above the ground at which said second end portion of said blade housing travels.

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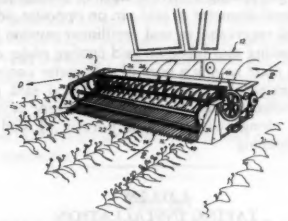
**4,313,296**

## COTTON STRIPPER

**L. E. Mitchell, Jr., P.O. Box 1367, Levelland, Tex. 79336**

**Filed Feb. 1, 1979, Ser. No. 8,787**
**Int. Cl.³ A01D *46/12***
**U.S. Cl. 56—34** **10 Claims**



1. In a cotton stripper having
- a. transport means attached to the stripper for moving the stripper through the cotton field in a direction of draft,
- b. a conveyor on the stripper traverse of the direction of draft,
- c. a plurality of parallel fingers on the stripper extending along the direction of draft from the conveyor forward and downward terminating with
- d. finger tips near the ground, and
- e. side shields on the stripper extending on both sides of the fingers;

the improved structure comprising in combination with the above:
- f. a rear shaft on the stripper parallel to and above the conveyor,
- g. rear sprockets on each end of the rear shaft,
- h. a hydraulic motor connected to the sprockets for rotating the rear shaft,
- j. front sprockets mounted and adjacent each side shield
- k. having a common axis parallel to the rear shaft,
- m. chains running around the sprockets adjacent each side shield, and
- n. at least two brush bars parallel to the rear shaft attached to and extending between the chains,
- o. said hydraulic motor rotating the rear shaft so that the speed of the chain on the stripper is less than the speed of the stripper on the ground.

4,313,297

## BLADE MOUNTING FOR A ROTARY MOWER

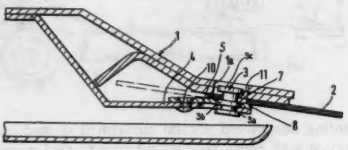
Martin Maier, Gottmadingen, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG Zweigniederlassung Fahr, Gottmadingen, Fed. Rep. of Germany

Filed May 16, 1980, Ser. No. 150,356

Claims priority, application Fed. Rep. of Germany, May 18, 1979, 2920244

Int. Cl.³ A01D *55/18, 55/22*

U.S. Cl. 56—295 4 Claims



1. A blade-mounting assembly for a rotary mower comprising:

a cutting plate rotatable about a substantially vertical rotary axis;

at least one blade disposed along the underside of said cutting plate;

a leaf spring extending radially outwardly and underlying said blade, said leaf spring being formed with a keyhole-shaped opening having a large-diameter circular portion and a rectilinear portion extending from said circular portion of a width less than the diameter of said circular portion;

a retaining pin having a narrow waist of a diameter less than the external diameter of said pin on opposite sides of said waist and receivable in said rectilinear portion for pivotally mounting said blade on said cutting plate; and

a retaining plate having a bore of a diameter corresponding to said external diameter and engaging said pin while being riveted to said leaf spring to prevent movement of said pin along the rectilinear portion of said keyhole-shaped opening.

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4,313,298

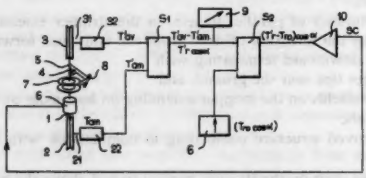
## TAPING INSTALLATION

Pierre Van Meenen, Rainvillers, France, assignor to Societe Anonyme Fileca, Sainte Genevieve, France

Filed Dec. 26, 1979, Ser. No. 106,910

Int. Cl.³ B65H *81/00, 81/08*

U.S. Cl. 57—3 5 Claims



1. A wire taping installation comprising a device supplying the wire, a device for receiving the taped wire, a taping device fed with tape, two pulleys round which the wire to be taped passes, the tape being applied against said wire between the two pulleys round which said wire passes, electrical pickup-ups respectively associated with each said pulley, said pick-ups supplying T'am, T'av signals proportional to the Tam and Tav tensions imparted by the wire as sensed at said pulleys, a first subtractor receiving said T'am, T'av signals so as to form a difference signal, a second subtractor, said difference signal being compared in said second subtractor with a theoretical value quantity, amplifier means, said difference signal being applied to said amplifier supplying a control signal to a device for regulating the tension of the tape.

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4,313,299

## METHODS AND APPARATUS FOR CHANGING BOBBINS IN FLYER SPINNING FRAMES

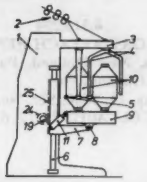
Siegfried Günkinger, Heiningen; Hans-Peter Weeger, Hattenhofen; Kurt Kriechbaum, and Wolfgang Igel, both of Ebersbach, all off, Fed. Rep. of Germany, assignors to Zinser Textilmaschinen Gesellschaft mit beschränkter Haftung, Ebersbach, Fed. Rep. of Germany

Filed Aug. 31, 1979, Ser. No. 71,505

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838398

Int. Cl.³ D01H *9/04*

U.S. Cl. 57—267 8 Claims



1. An apparatus for changing bobbins in flyer spinning frames having locally stationary, rotatably suspended flyers, a bobbin rail having spindles supported on said frame for both tilting and up and down movements and bobbins rotatably supported on said tiltable bobbin rail, reversible drive means for moving said bobbin rail up and down, means for tipping said bobbin rail outwardly from said frame, control means for reversing the driving direction of said drive means, a plurality of switching devices operatively associated with said drive means, said plurality of switching devices including a switching device actuatable in a position for tipping said bobbin rail outwardly of said spinning frame for operatively conditioning said drive means to raise said bobbin rail, a switching device actuatable in a position of said bobbin rail for removal of said bobbins and for operatively conditioning said drive means to stop further movement of said bobbin rail, and a manually operative switching device actuated by an operator after the removal of the filled bobbins and placing the empty tubes on the spindles for operatively conditioning said drive means to lower said bobbin rail.

5. A method of changing bobbins in flyer spinning frames having a head and locally stationary, rotatable suspended flyers, a bobbin rail having spindles supported on said frame for both tilting and up and down movements and bobbins rotatably supported on said tiltable bobbin rail, comprising the steps of:

moving said bobbin rail down by a reversibly driving means, when said bobbins are filled,

selectively actuating a plurality of switching devices for tilting said bobbin rail outwardly of said spinning frame and for operatively conditioning said drive means to raise said bobbin rail,

tilting said bobbin rail outwardly from said frame by a bobbin rail tilting means,

moving said bobbin rail up by said reversibly driving means,

actuating a switching device in a position of said bobbin rail for removal of said bobbins and for operatively conditioning said drive means to stop further movement of said bobbin rail,

removing the filled bobbins and placing empty bobbins on the spindles,

actuating a manually switching device for operatively conditioning said drive means to lower said bobbin rail,

tilting said bobbin rail inwardly to said frame by said bobbin rail tilting means,

moving said bobbin rail up to a starting position by said reversibly driving means.

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**4,313,300**

## NOX REDUCTION IN A COMBINED GAS-STEAM POWER PLANT

**Colin Wilkes, Scotia, and Bruce W. Gerhold, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Jan. 21, 1980, Ser. No. 113,635**
**Int. Cl.³ F02C *6/18***
**U.S. Cl. 60—39.02** **7 Claims**

**1**. A method of operating a combined gas-steam power plant with improved control of NOx emissions comprising compressing air in an air compressor, introducing said compressed air and fuel into a combustor and burning the resulting mixture therein, employing the combustor exhaust gases to operate a gas turbine, employing the gas turbine exhaust gases to operate a steam boiler, venting a portion of the steam boiler exhaust gases, cooling the remaining portion of the steam boiler exhaust gases to about the desired air compressor inlet temperature, introducing said cooled steam boiler exhaust gases into said air compressor, and controlling the relative rate of venting and introduction to said air compressor such that said cooled steam boiler exhaust gases comprise up to about 30% of the fluid flowing through said air compressor.

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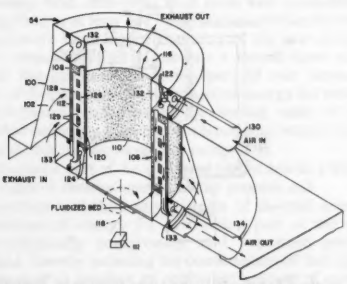
**4,313,301**

## ROTATING FLUIDIZED BED HEAT EXCHANGER

**William H. Belke, Peoria; Alexander Goloff, East Peoria, and George B. Grim, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**

**PCT No. PCT/US79/00937, § 371 Date Oct. 25, 1979, § 102(e) Date Oct. 25, 1979, PCT Pub. No. WO81/01194, PCT Pub. Date Apr. 30, 1981**
**PCT Filed Oct. 25, 1979, Ser. No. 102,196**
**Int. Cl.³ F02C *7/08*; F28D *13/00***
**U.S. Cl. 60—39.51 H** **30 Claims**




**30**. In a gas turbine engine (**12**) including a compressor (**20**), a combustor (**26**), a gasifier turbine (**22**), a first shaft (**14**) mounting said compressor (**20**) adjacent a first end thereof and said gasifier turbine (**22**) adjacent the other end thereof, said turbine (**22**) having blades positioned in the path of exhaust gases exiting said combustor (**26**) to drive said first shaft (**14**) and said compressor (**20**), a power turbine (**40**) having blades positioned in the path of exhaust gases exiting said gasifier turbine (**22**), a second shaft (**42**) driven by said power turbine (**40**) for delivering output work, a heat exchanger (**54**) for receiving compressed gas from said compressor (**20**), heating said compressed gas therein and passing said heated compressed gas to said combustor (**26**) and for receiving exhaust gas from said power turbine (**40**), cooling said exhaust gas while transferring some of its heat to said compressed gas and exhausting the resulting cooled exhaust gas, the improvement comprising:

a rotatable fluidized bed heat exchanger (**54**) comprising:

a. a first elongated perforated wall (**108**);

b. a second perforated wall (**110**) spaced apart and substantially co-extensive with said first perforated wall (**108**);

c. enclosing walls (**109**) defining with said first and second perforated walls (**108, 110**) a fluidization chamber (**112**);

d. a fluidizable bed of pulverulent solid particles (**114**) in said chamber (**112**);

e. means (**111**) for rotating said chamber (**112**) about an axis (**118**) to cause the particles (**114**) to centrifugally gravitate toward said first perforated wall (**108**);

f. means (**102**) for feeding said exhaust gas into said chamber (**112**) through said first perforated wall (**108**) and out of said chamber (**112**) through said second perforated wall (**110**), said exhaust gas heating and having flow characteristics suitable for fluidizing said particles (**114**) in said chamber (**112**);

g. at least one tube (**120**) in said chamber (**112**) extending substantially co-extensively with said walls (**108, 110**) for passing said compressed gas therethrough, said at least one tube (**120**) directing the flow of said compressed gas longitudinally within said chamber (**112**) from an inlet (**122**) generally adjacent said second perforated wall (**110**) to an outlet (**124**) generally adjacent said first perforated wall (**108**), whereby said compressed gas flows countercurrently to said exhaust gas, said compressed gas is heated by the heated bed particles and said exhaust gas and said exhaust gas is cooled; and

h. means (**134,80**) for directing said heated compressed gas to said combustor.

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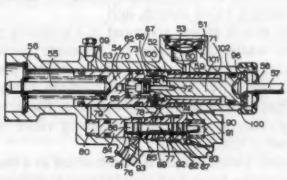
**4,313,302**

## HYDRAULIC POWER BOOSTERS FOR VEHICLE BRAKING SYSTEMS

**Glyn P. R. Farr, Leek Wootton, England, assignor to Girling Limited, Birmingham, England**

**Continuation of Ser. No. 907,584, May 19, 1978, abandoned. This application Aug. 29, 1980, Ser. No. 182,581**
**Claims priority, application United Kingdom, May 19, 1977, 21047/77; Oct. 5, 1977, 41350/77**
**Int. Cl.³ B60T *13/00***
**U.S. Cl. 60—547 R** **12 Claims**



**1**. An hydraulic booster for a vehicle braking system comprising a housing having a bore, and a boost piston working in said bore to actuate a master cylinder piston, a pedal-operated input piston, and a second piston relative to which said input piston is movable, and said housing is provided with a boost chamber for subjecting said boost piston to hydraulic pressure, and a control chamber is defined between said input piston and said second piston, a boost-pressure control valve being pro-

vided for controlling a supply of hydraulic pressure to said boost chamber, said boost-pressure control valve being responsive to pressure in said control chamber, wherein a recuperation valve is located in said control chamber for controlling communication between said control chamber and a reservoir, said recuperation valve closing upon relative movement of said input piston towards said second piston, further movement of said input piston in the same direction causing pressurization of fluid trapped in said control chamber, a reservoir chamber in said housing providing communication between said reservoir and said recuperation valve, first seal means disposed between said boost chamber and said reservoir chamber, second seal means disposed between said control chamber and said reservoir chamber, said seal means being arranged that said control and booster chambers are separated from each other by said reservoir chamber so that upon failure of either of said seal means, fluid from the respective control or boost chamber flows directly into said reservoir chamber and cannot flow from said boost chamber directly into said control chamber or vice versa depending on which of said seal means fails, without first flowing into said reservoir chamber.

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**4,313,303**

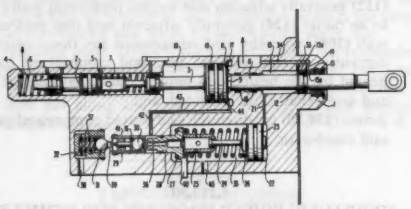
## BRAKE FORCE BOOSTER, ESPECIALLY FOR MOTOR VEHICLES

**Reinhard Resch, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany**

**Continuation of Ser. No. 786,772, Apr. 12, 1977, abandoned. This application Dec. 26, 1978, Ser. No. 973,012**

**Int. Cl.³ B60T *13/20***

**U.S. Cl. 60—556** **13 Claims**



1. A brake force servo-device, comprising

a servo-housing,

a selectively actuatable control piston means arranged in a cylinder space in the servo-housing,

a connecting valve means operatively connected with the selectively actuatable control piston means and with a pressure medium source,

said control piston means being operable to displace a flow medium out of the cylinder space for an actuation of the connecting valve means, and

working piston means arranged in a working pressure space means adapted to receive a pressure medium from the pressure medium source, the working piston means is acted upon by the pressure medium from the pressure medium source with the pressure of the pressure medium being controlled by the connecting valve means, characterized in that

the control piston means is constructed as a one piece differential piston having an annular step and an end face spaced from the annular step, the end face projects into the working pressure space means of the working piston means and is in direct mating engagement with an end face of the working piston means during operation of the brake force servo-device so that a pressure acts on an entire surface of the end face of the differential piston,

a first seal means is provided for sealing the control piston means within an area of entry of the control piston means into the servo-housing,

a second seal means is provided for sealing the control piston means in proximity of the end face of the control piston means projecting into the working pressure space means,

the first and second seal means defining an annular space therebetween for forming the cylinder space from which the pressure medium is displaced by the control piston means,

the connecting valve means is actuated by pressure medium displaced by the annular step of the control piston means out of the annular space, and in that

the pressure source connecting valve means is provided for controlling a supply of the pressure medium to the working pressure space means,

the connecting valve means includes

a connecting valve piston means having a control pressure space in communication with the annular space,

a valve seat piston means acted upon by the connecting valve piston means is provided for actuating the pressure source connecting valve means, and

a valve spring means is disposed between the valve seat piston means and the connecting valve piston means,

the control piston means produces a control pressure in the control pressure space which acts on a side of the connecting valve piston means opposite the valve seat piston means so as to cause a displacement of the connecting valve piston means and the valve seat piston means, and in that

the valve spring means produces a force which acts on a side of said connecting valve piston means opposite the control pressure space, said force opposing the force provided by the control pressure in the control pressure space acting upon the connecting valve piston means for a displacement of the connecting valve piston means and the valve seat piston means so as to enable an actuation of the pressure source connecting valve means.

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**4,313,304**

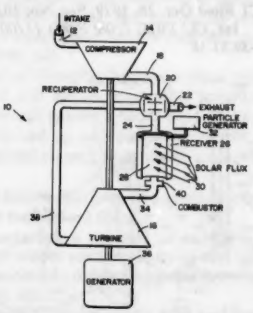
## RADIANT ENERGY COLLECTION AND CONVERSION APPARATUS AND METHOD

**Arlon J. Hunt, Oakland, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Jul. 26, 1979, Ser. No. 61,165**

**Int. Cl.³ F03G *7/02***

**U.S. Cl. 60—641.8** **15 Claims**




1. A method for producing power from solar radiation flux, including the steps of:

disbursing radiant energy absorbent vaporizable particles in a fluid stream;

passing the fluid stream and disbursed vaporizabele particles past the solar radiation flux to heat the particles and the fluid;

allowing the particles to vaporize by absorbing solar radiation flux; and

allowing the heated stream to expand through means to produce power.

6. A method of transferring energy including the steps of:

providing a hot fluid stream having hot solar radiation vaporizable particles of submicron diameters disbursed therein; vaporizing said particles by solar radiation;

providing a cooler fluid stream having cooler solar radiation vaporizable particles of submicron diameters disbursed therein, which particles can be vaporized by said solar radiation;

passing the hot fluid stream adjacent the cooler fluid stream to warm the cooler fluid and cooler particles by heat transfer from the hot fluid stream in a heat exchange relationship.

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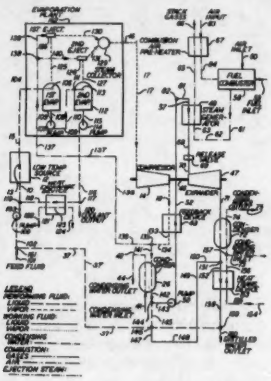
**4,313,305**

## FEEDBACK ENERGY CONVERSION SYSTEM

**Dan Egosi, 7 Ben Gurion Blvd., Tel Aviv, Israel**

**Filed Sep. 18, 1979, Ser. No. 76,664**
**Int. Cl.³ F01K *17/00***
**U.S. Cl. 60—648** **57 Claims**



1. A method for increasing the ratio of thermal energy output to heating value of fuel consumed in a heat pumping process which includes delivering a first input stream of thermal energy from a low temperature source to a flow of performing fluid in the liquid state, vaporizing at least part of said flow of performing fluid, mechanically compressing said vaporized performing fluid, delivering heat from said compressed performing fluid as at least one output stream of thermal energy at a temperature level higher than that of the low temperature source, consuming fuel to generate a second input stream of thermal energy, and converting part of said second input stream of thermal energy to mechanical energy for performing said mechanical compression, the heating value of the fuel consumed being less than the corresponding output heat delivered, wherein the improvement comprises:

feeding back part of the stream of output heat as a third input stream of thermal energy to the process and

converting said third input stream of thermal energy into mechanical energy for performing part of the work of mechanically compressing said vaporized performing fluid, thereby reducing the consumption of fuel otherwise required to produce an equivalent amount of mechanical energy without reducing the total work input required for said mechanical compression.

32. Heat pumping apparatus for providing an increased ratio of thermal energy output to heating value of fuel consumed, the apparatus including means for delivering a first input stream of thermal energy from a low temperature source to a flow of performing fluid in the liquid state, means for evaporating at least part of the flow of performing fluid, mechanical compressor means having an input connected to the evaporating means for compressing the vaporized part of the performing fluid at a temperature higher than temperature of the low temperature source, heat engine means for consuming fuel as a second input stream of thermal energy and for delivering at least part of the mechanical energy required for driving the mechanical compressor, and means connected to the output of the mechanical compressor means for delivering a greater quantity of heat from said compressed performing fluid as at least one output stream of thermal energy than the heating value of the fuel consumed, wherein the improvement comprises:

means coupled to said means for delivering at least one output stream of thermal energy for returning part of said at least one output stream as a third input stream of thermal energy and

means for converting said third input stream of thermal energy into mechanical energy for performing part of the work of mechanically compressing said vaporized performing fluid, thereby reducing the amount of fuel otherwise required to produce an equivalent amount of mechanical energy.

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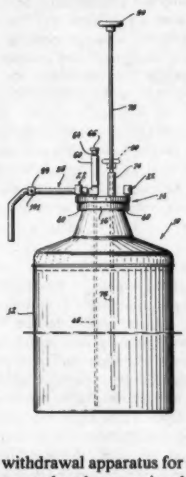
**4,313,306**

## LIQUIFIED GAS WITHDRAWAL APPARATUS

**Douglas P. Torre, 7 Parkview Ave., Rowayton, Conn. 06853**

**Filed Apr. 21, 1980, Ser. No. 142,864**
**Int. Cl.³ F17C *7/02***
**U.S. Cl. 62—51** **7 Claims**



1. Liquified gas withdrawal apparatus for removing liquified gas coolant from an enclosed reservoir adapted to receive a quantity of said liquified gas coolant, said apparatus comprising:

a delivery tube having one end adapted to be immersed in the liquified gas coolant within said reservoir and capable of conducting the coolant outwardly of said reservoir;

means for selectively pressurizing said reservoir in the presence of the coolant to thereby force coolant along said delivery tube, said means including

reciprocable rod means selectively slidable in heat exchange relation into and out of said reservoir for contact with said liquified gas coolant to increase the boiling rate of said coolant and build up pressure in said reservoir;

valve means in communication with said delivery tube for selectively blocking the other end of said delivery tube to prevent conduction of said coolant from said reservoir; and

vent means normally open to the atmosphere in communication with the space above the level of coolant in said

reservoir, said reciprocable rod means being received within said vent means to close said vent means to the atmosphere when said rod means is selectively slidable in heat exchange relation into and out of said reservoir.

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**4,313,307**

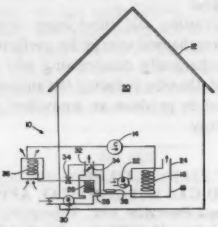
## HEATING AND COOLING SYSTEM AND METHOD

**Francis J. Sisk, Apollo, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.**

**Continuation of Ser. No. 832,283, Sep. 12, 1977, abandoned. This application Jun. 1, 1979, Ser. No. 44,684**

**Int. Cl.³ F25B** *7/00, 27/02*

**U.S. Cl. 62—79** **3 Claims**



1. A method of operating a compression-expansion cycle refrigerating machine for transferring heat from a volume of air within an enclosure to ambient air, the enclosure comprising a mobile refrigerating compartment, and the refrigerating machine including a condenser coil outside the enclosure, an evaporator coil within the enclosure and a subcooler coil connected in a series between the condenser coil and evaporator coil, including the steps of compressing a working fluid, transferring heat from the compressed fluid to the ambient air for condensing the fluid by directing a stream of relative moving ambient air in heat exchange relationship with the condenser coil during movement of the compartment, directing a stream of air for extraction from the volume within the enclosure to the ambient air in heat transfer relationship with the condensed fluid for transferring heat to the stream of air and for subcooling the condensed fluid, said air being extracted from the volume along a path in heat exchange relationship with the subcooler and thereafter to ambient air whereby heat extracted from the subcooled condensed fluid is expelled to ambient air, creating a partial vacuum by movement of the compartment relative to ambient air for extracting air from the compartment along said path in heat exchange relationship with the subcooler coil, reducing the pressure of the subcooled fluid to cause it to expand into a gas while undergoing a reduction in temperature, and transferring heat from the volume of air to the expanded gas with the heat from the subcooled condensed fluid being transferred to the stream of air directed to ambient air for increasing the Coefficient of Performance and Capacity of the refrigerating machine.

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**4,313,308**

## TEMPERATURE CONTROL WITH UNDERCOOL PROTECTION

**James P. Boratgis, Lee Hill Rd., and Earle S. Pittman, 2269 Mariposa, both of Boulder, Colo. 80302**

**Filed Sep. 8, 1980, Ser. No. 184,965**

**Int. Cl.³ F25B** *49/00, 29/00*

**U.S. Cl. 62—126** **11 Claims**

1. In refrigerator electronic control apparatus for controlling the temperature in and providing a malfunction signal for a refrigeration unit associated with a refrigerated chamber, the combination comprising:

temperature sensor means for said chamber;

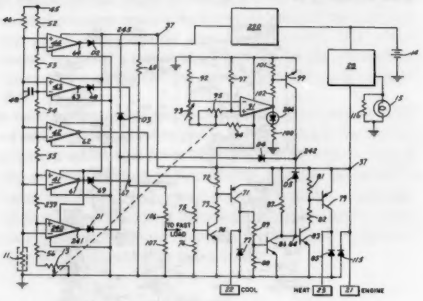
temperature selector means for said chamber having a range of temperature settings; and

electronic circuit means including:

temperature reference means operatively associated with said temperature selector means, said temperature reference means establishing a plurality of temperature reference points at selected temperature increments above and below a set point,

a comparator associated with each of said temperature reference points, each comparator responsive to an output of the associated set point and to an output of said temperature sensor means, and

control means including a plurality of solid state control elements, each control element responsive to an output of one of said comparators for alternately effecting the actuation of a heat load device in said refrigeration unit when the temperature in said chamber is a selected temperature increment below said set point and effecting the actuation of a cool load device in said refrigeration unit when the temperature in said chamber is a selected temperature increment above said set point to automatically maintain the temperature in said chamber



within a selected temperature range and for also effecting the actuation of a malfunction indicator and disabling a prime mover load device to stop said refrigeration unit in the event of a malfunction in said refrigeration unit when the temperature in said chamber exceeds a selected maximum temperature reference point above said set point and, in the alternative, when the temperature in said chamber exceeds a selected minimum temperature reference point below said set point in a first operating mode, there being shut-off means operatively associated with said temperature selector means including a control element for disabling any heating operation by said refrigeration unit when said temperature is below a selected low temperature and for preventing the actuation of said malfunction indicator due to an undercool condition when the temperature in said chamber exceeds said selected minimum temperature reference point below said set point in a second operating mode, said selected low temperature being below said selected minimum temperature reference point.

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**4,313,309**

## TWO-STAGE REFRIGERATOR

**Robert D. Lehman, Jr., c/o Vacudyne Industries Corp., 31 Heisser Ct., Farmingdale, N.Y. 11735**

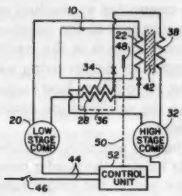
**Filed Nov. 23, 1979, Ser. No. 96,644**

**Int. Cl.³ F25B** *7/00*

**U.S. Cl. 62—175** **1 Claim**

1. Improvements in the operational mode of refrigerating unit of the type used in a room environment and having wall means bounding a freezer compartment for the storage of materials requiring refrigeration, said unit being comprised of a high stage refrigeration system having coil means respectively providing refrigerant compression and evaporation phase changes, and a low stage refrigeration system having coil

means respectively similarly providing refrigerant compression and evaporation phase changes but at lower temperatures, said operational mode including said low stage evaporation coil means being located in refrigerating adjacent relation to said freezer compartment and said condenser coil means thereof and said high stage evaporation coil means being located in heat exchange relation to each other and both said coil means also being located in adjacent relation to said freezer compartment, said improvements in said aforesaid operational mode comprising a temperature-sensitive probe operatively disposed in said freezer compartment, and control means connected from said probe in controlling relation to both said high




and low stage refrigeration systems so as to simultaneously terminate the operation of both said systems upon the achievement of a selected temperature in said freezer compartment such that incident to the termination of the operation of said high stage refrigeration system there is a corresponding termination of the dissipation of heat from the condenser coil means thereof, whereby there is obviated the adverse effect of said high stage condenser coil heat disspation and both said systems are nevertheless maintained in proper condition to again resume simultaneous operation due to the cooling by said freezer compartment of said coil means in heat exchange relation with each other during said non-operating periods of said systems.

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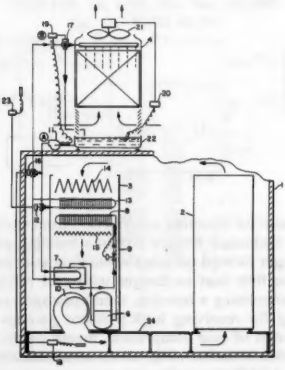
**4,313,310**

## COOLING SYSTEM

**Kyoji Kobayashi, Sagamihara; Takaichi Kosaka, Hino; Sigeki Takahara, Kawasaki, and Akira Tamura, Chiba, all of Japan, assignors to Fujitsu Limited and Fuji Kaden Co., Ltd., both of, Japan**

**Filed Sep. 3, 1980, Ser. No. 183,736**
**Claims priority, application Japan, Sep. 7, 1979, 54-115003**
**Int. Cl.³ F25B *39/04, 25/00***
**U.S. Cl. 62—175** **8 Claims**



**1.** A cooling system comprising:
air conditioning apparatus comprising:
a compressor;
a condensor;
means for connecting said compressor and condensor;
an evaporator;
means for connecting said evaporator to said condensor and said compressor; and
a blower for blowing air passing over said condensor;
an outdoor cooling tower operatively connected to said condensor, for cooling and circulating cold water in a circulation path to and from said condensor;
a cold water switching valve operatively connected in said cold water circulation path; and
a cold water coil connected to said cold water circulation path through said cold water switching valve;
said cold water switching valve selectively switching said cold water circulation path to one of said condensor and said cold water coil in accordance with the temperature of the outdoor air.

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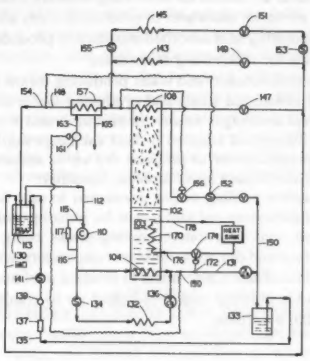
**4,313,311**

## VAPOR GENERATING AND RECOVERING APPARATUS

**James W. McCord, 9101 Nottingham Pkwy., Louisville, Ky. 40222**

**Filed Jun. 4, 1979, Ser. No. 44,955**
**Int. Cl.³ F25B *41/00*; B01D *3/00***
**U.S. Cl. 62—197** **13 Claims**



**1.** In a vapor generating and recovering apparatus for vaporizing a liquid and condensing a vapor, including a housing having at least one compartment therein, said compartment having a liquid and a vapor therein, the improvement comprising:

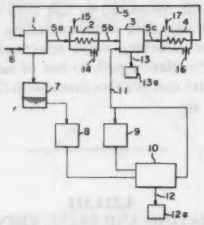
a heating and cooling system in heat transfer relation with said liquid and said vapor in said compartment, said system including a main condenser in heat emitting relation with said liquid; a main evaporator in heat absorbing relation with said vapor; means to compress a refrigerant, said means to compress being in fluid communication on its high pressure side with said main condenser and on its low pressure side with said main evaporator, said system including expansion means disposed between said main condenser and said main evaporator; and, a first heat exchanger disposed within the liquid zone of said compartment in heat exchange relation with a heat exchanger source outside said heating and cooling system, said first heat exchanger including a heat transfer fluid disposed solely therein to remove heat from said compartment transferring said heat outside said compartment to means to remove heat from said heat transfer fluid, said fluid being independent of said liquid to be vaporized and said refrigerant in said heating and cooling system.

4,313,312

## WATER PRODUCING AIR CONDITIONING SYSTEM

Toshio Ito; Hiromasa Matsuoka; Yoshio Hirayama, and Nobuyoshi Takahashi, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1980, Ser. No. 133,432
Claims priority, application Japan, Mar. 22, 1979, 54-34001
Int. Cl.[3] F25D *23/00*
U.S. Cl. 62—271 6 Claims



1. A system for producing water and conditioning air, comprising:

a water producing means including means for introducing ambient air, means for adsorbing moisture from said ambient air on an adsorbent to produce hot dry air, means for evaporating said adsorbed moisture to produce steam and means for condensing said steam;

means connected to said water producing means for utilizing said condensed steam and producing waste water;

first heat exchanger means connected to said water producing means and adapted to heat exchange said hot dry air with ambient air to produce dry air at ambient temperature and heated air of ambient humidity;

evaporative cooling means connected to said first heat exchanger means and said means for utilizing said condensed steam, said evaporative cooling means being adapted to contact said dry air at ambient temperature with at least a portion of said waste water to produce cool humid air; and

means for utilizing said cool humid air to condition the air within a volume.

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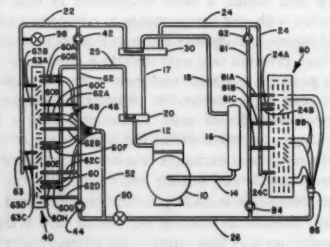
4,313,313

## APPARATUS AND METHOD FOR DEFROSTING A HEAT EXCHANGER OF A REFRIGERATION CIRCUIT

Ronald F. Chrostowski, Liverpool; Rudy C. Bussjager, Syracuse, and James J. del Toro, North Syracuse, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 17, 1980, Ser. No. 112,876
Int. Cl.[3] F25B *47/00*
U.S. Cl. 62—278 5 Claims



1. A reversible refrigeration system adapted for heating and cooling having a compressor, an indoor heat exchanger, an outdoor heat exchanger, a reversing valve and an expansion device associated with each heat exchanger which comprises:

a three-way valve connected to the compressor and to the reversing valve;

an interconnecting line for conducting refrigerant between the indoor heat exchanger and the outdoor heat exchanger;

a first header connected to the reversing valve for supplying refrigerant to the outdoor heat exchanger when the refrigeration system is in the cooling mode of operation and for receiving refrigerant discharged from the outdoor heat exchanger when the refrigeration system is in the heating mode of operation;

a second header connected to conduct refrigerant from the outdoor heat exchanger to the interconnecting line when the refrigeration system is in the cooling mode of operation and connected to the reversing valve for conducting refrigerant from the outdoor heat exchanger to the reversing valve when the refrigeration system is in the heating mode of operation;

an intermediate header assembly including feeder tubes and an intermediate header, the header being connected to the three-way valve and to the feeder tubes, at least some of the feeder tubes being connected to the circuits of the outdoor heat exchanger, said intermediate header serving to conduct refrigerant between circuits of the outdoor heat exchanger when the refrigeration system is in the cooling mode of operation; and

wherein the expansion device associated with the outdoor heat exchanger is connected to the outdoor heat exchanger through the feeder tubes of the intermediate header whereby upon the three-way valve being appropriately positioned and while the reversing valve is in the heating mode of operation gaseous refrigerant from the compressor may be directed by the three-way valve through the intermediate header assembly to the circuits of the outdoor heat exchanger to effect defrost of said heat exchanger.

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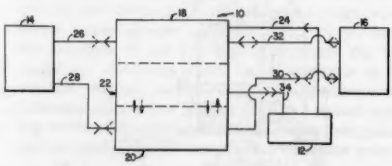
4,313,314

## AIR CONDITIONER/HEAT PUMP CONVERSION APPARATUS

Joseph E. Boyanich, Hixson, Tenn., assignor to Alan Ruderman, Chattanooga, Tenn., a part interest

Filed Aug. 7, 1980, Ser. No. 176,253
Int. Cl.[3] F25B *13/00*
U.S. Cl. 62—324.1 7 Claims



1. Apparatus for directing a refrigerant from a compressor to a first heat exchanger located within a building and a second heat exchanger located outside the building selectively to cool and heat the first heat exchanger with said refrigerant, said apparatus comprising a housing, a first passageway formed in said housing for receiving high pressure gaseous refrigerant from the outlet of said compressor, means defining first and second cavities in said housing, means communicating said first cavity with said first passageway, means communicating said second cavity with the low pressure inlet side of said compressor, a reversing valve having operator means slideably mounted for movement in said cavities between two positions, means for moving said operator means selectively to one of said positions, a second passageway in said housing communi-

cating with said first cavity when said operator means is in a first position and closed by said operator means when in the second position, a third passageway in said housing communicating with said cavity when said operator means is in said second position and closed by said operator means to communicate with said cavity when in the first position, means for communicating said second passageway with said second heat exchanger, means for communicating said third passageway with said first heat exchanger, a fourth passageway formed in said housing, means for communicating one end of said fourth passageway with said first heat exchanger and means for communicating with the other end of said fourth passageway with said second heat exchanger, a second valve operator disposed in said fourth passageway and moveably directed to a first position by high pressure liquid refrigerant from the second heat exchanger when said reversing valve operator is in the first position to close said passageway to the first heat exchanger and moveably directed to a second position by high pressure liquid refrigerant in the first heat exchanger when said reversing valve operator is in the second position to close said passageway to the second heat exchanger, an expansion valve having an inlet and an outlet mounted in said housing for lowering the pressure of liquid refrigerant flowing therethrough, means communicating the inlet of said expansion valve with said fourth passageway, a fifth passageway formed in said housing and communicating said outlet of said expansion valve with said first and second heat exchangers, check valve means in said fifth passageway moveably directed to close communication between said expansion valve outlet and said second heat exchanger when said reversing valve operator means is in the first position and to close communication between said expansion valve outlet and the first heat exchanger when the reversing valve operator means is in the second position, a sixth passageway formed within said housing communicating said second cavity with said first heat exchanger when said expansion valve operator means is in said first position and closing communication therewith when in said second position, and a seventh passageway formed within said housing communicating said second cavity with said second heat exchanger when said reversing valve operator means is in said second position and closing communication therewith when in said first position.

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**4,313,315**

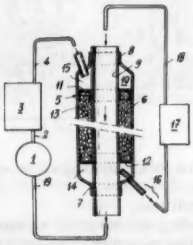
## COMPRESSOR REFRIGERATION CIRCUITS

**Gabriele Calderoni, Varese, and Gian A. Gavina, Pavia, both of Italy, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Feb. 19, 1980, Ser. No. 122,082**

**Int. Cl.³ F25B *43/04***

**U.S. Cl. 62—475** **5 Claims**



**1.** A closed refrigeration circuit which comprises in series a compressor, a condenser, a drier-filter containing a drying-filtering material, a capillary tube, an evaporator, a conduit connecting the evaporator to the condenser and traversing the drier-filter, and a refrigerant fluid for circulation in operation through said series-arranged elements, said drier-filter thereby also serving as a heat exchanger.

**4,313,316**

## CONDENSER PURGE SYSTEM

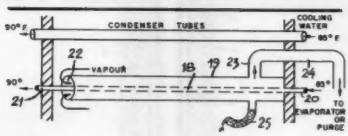
**Isaih Vardi, Rehovot; Yigal Kimchi, Ramat Gan, and Jonathan Ben-Dror, Hadar Am, all of Israel, assignors to Tadiran Israel Electronics Industries Ltd., Tel Aviv, Israel**

**Filed May 15, 1980, Ser. No. 150,137**

**Claims priority, application Israel, May 16, 1979, 57307**

**Int. Cl.³ F25B *43/04***

**U.S. Cl. 62—475** **1 Claim**




**1.** In a chiller of the type using water as a refrigerant and an aqueous lithium bromide, or a similar compound, as an absorbant, wherein non-condensable gases and water vapor are purged from a condenser comprising a tube bundle to an evaporator, the improvement which comprises:

a condenser tube having an inlet means for receiving a cold coolant thereby defining a cold end of the chiller, and an outlet means for removing a warmed coolant thereby defining a warm end of the chiller;

a concentric tube surrounding the condenser tube, thereby defining an annular space between the condenser tube and the concentric tube, said concentric tube having an inlet means at the warm end for receiving water vapor and non-condensable gas into said annular space, and an outlet means for removing condensed water at the cold end, and an outlet means for removing vapor and non-condensable gases at the cold end, said outlet means for vapor and non-condensables being in communication with said evaporator.

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**4,313,317**

## BOREHOLE LOGGING TOOL CRYOSTAT

**Sylvain Jænssen, Neuilly; Jean Tourret, Montrouge; Alain Zarudiansky, Velizy, and Roland Allesch, Antony, all of France, assignors to Schlumberger Technology Corp., Houston, Tex.**

**Filed Jun. 19, 1980, Ser. No. 161,059**

**Claims priority, application United Kingdom, Jun. 21, 1979, 21750/79**

**Int. Cl.³ F25B *19/00***

**U.S. Cl. 62—514 R** **18 Claims**

**1.** A cryostat for a high-sensitivity photon detector and adapted for use in a borehole logging tool, comprising:

an evacuable housing of generally tubular form;

an elongate single-phase heat sink of solid, thermally-conductive material disposed within said housing for thermal contact with a photon detector to be maintained at cryogenic temperatures;

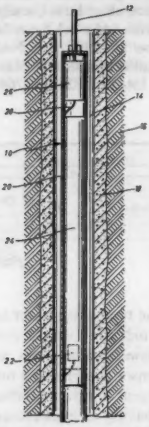
means for establishing thermal contact between said heat sink and a cooling means separate from said cryostat, prior to use of the cryostat;

at least one rigid thermal shielding means made of a thermally conductive material, disposed within and in a spaced relationship from said housing, said thermal shielding means disposed in a spaced relationship from said heat sink;

the thermal shielding means and heat sink having substantially the same heat energy capacity; and

means for mounting said heat sink and thermal shielding means in said housing, said mounting means having low thermal conductivity and includes means for permitting

differential changes in length of said housing relative to said heat sink whereby, in use, said detector is maintained



at cryogenic temperatures by absorption and retention of heat by said heat sink and thermal shielding means.

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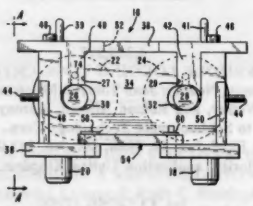
**4,313,318**

## ADJUSTABLE KELLY BUSHING FOR DOWNHOLE DRILLING SYSTEM

**Homan C. Tullos, Lafayette, La., and Dewey W. Woods, Livingston, Tex., assignors to Tullos & Woods Tools, Inc., Lafayette, La.**

**Continuation-in-part of Ser. No. 9,149, Feb. 5, 1979, Pat. No. 4,258,802. This application Jan. 31, 1980, Ser. No. 117,084**
**Int. Cl.³ E21B *17/00, 3/04***
**U.S. Cl. 64—23.6** **16 Claims**



1. An adjustable kelly bushing for use with a drill string provided with a kelly at its upper end, comprising:

a base;

support means provided on said base including a plurality of vertical slots formed therein and a pair of shafts mounted in said vertical slots;

a pair of rollers rotatably mounted on said shafts for receiving and guiding the kelly therebetween, said rollers being adapted to permit vertical movement of the kelly relative to said base but to preclude rotational movement of the kelly;

insert means adapted to be received in each of said slots and provide a set of apertures wherein said shafts are contained;

at least one pair of said apertures corresponding to one of said shafts being adapted to permit said shaft to assume different horizontal positions therein; and

means for adjusting the position of said one shaft in its corresponding apertures to vary the spacing between said rollers to accommodate different sized kellys.

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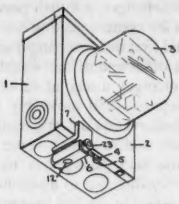
**4,313,319**

## LOCK AND KEY COMBINATION WITH MASTERING CONCEPT

**Paul Z. Haus, Jr., 787 Hartwell St., Teaneck, N.J. 07666, and John A. Signorelli, 2150 E. 29th St., Brooklyn, N.Y. 11229**

**Filed Apr. 14, 1980, Ser. No. 140,255**
**Int. Cl.³ E05B *67/36***
**U.S. Cl. 70—34** **23 Claims**



1. A plunger-type lock having an elongated body with a central, longitudinally extending bore, extensible locking members movable inwardly and outwardly of said body, key-operable plunger means reciprocable longitudinally of said bore for alternately locking said locking members outwardly of said body and permitting said locking members to move inwardly of said body, said body having a key seating face at one end of said bore which faces away from said plunger means and which is exposed at the exterior of said body, said face being at a predetermined distance from a portion of said plunger when the latter is in the position thereof which locks said members outwardly of said body, whereby a key having a plunger means operating portion spaced said predetermined distance from the portion thereof which engages said face can engage said portion of said plunger and move said plunger means longitudinally of said bore, and shaped means on said body and extending from said face for engaging a surface of a key and preventing seating on said face of said last-mentioned key when said last-mentioned key has a configuration which prevents receipt of said shaped means therein.

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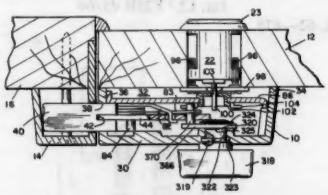
**4,313,320**

## RIM LOCK WITH CLASSROOM FUNCTION

**Walter E. Best, and William R. Foshee, both of Indianapolis, Ind., assignors to Best Lock Corporation, Indianapolis, Ind.**

**Filed Nov. 30, 1978, Ser. No. 965,186**
**Int. Cl.³ E05B *65/06, 65/10***
**U.S. Cl. 70—134** **9 Claims**



1. A dead bolt rim lock providing classroom function, comprising

a case having a front wall,

a dead bolt including an integrally connected draw plate, mounted for sliding movement between a projected locking position and a retracted unlocked position,

said draw plate extending rearward in the case and having a cross slot therein,

a crank arm mounted for rotation in a plane between the front wall and draw plate,

a crank pin on said crank arm extending into said slot,

said crank pin having a forward centered position substantially on a longitudinal center line intersecting the axis of rotation

of the crank arm when the bolt is in projected position and having a rearward centered position when the bolt is in retracted position, the cross slot having an inner end to contain the crank pin in such centered positions, and extending one way transversely of said center line to allow the pin to move out lengthwise of the slot as the pin swings through 180° between its said centered positions,

a turnknob spindle rotatably mounted through the front wall of the case, the crank arm being mounted on the inner end of the spindle, and a turnknob on the spindle,

said crank arm being mounted on said spindle by means providing rotational lost motion therebetween through an angle at least equal to the throw of the crank pin between its centered positions,

means to limit rotation of the turnknob relative to the case,

said lost motion and rotation limiting means being so related that the turnknob is operative to retract the bolt and inoperative to advance it.

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**4,313,321**

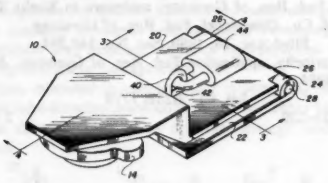
## FUEL TANK LOCK

**Donald F. Wasser, 214 S. Chestnut, St. Elmo, Ill. 62458**

**Filed Dec. 5, 1979, Ser. No. 100,427**

**Int. Cl.³ B65D *55/14***

**U.S. Cl. 70—159** **3 Claims**



1. A locking means for a fuel tank having a fuel cap comprising first and second plates joined along one edge by a hinge, said first plate opposite said hinge extending beyond said second plate substantially the width of said fuel cap and matching the curvature of the tank, means for bolting said second plate to the fuel tank, said hinge spacing the first plate from the second plate such that the first plate overlies the means for bolting, said second plate adapted to be bolted to the fuel tank such that the first plate overlies the fuel cap without enclosing it when said first and second plates are hinged closed to prevent removal of the fuel cap, means for shackling said first and second plates closed, said means for shackling the first and second plates closed comprising a staple, a hasp and a padlock, said staple attached to the second plate and said first plate having a slot forming the hasp through which the staple passes whereby the fuel cap cannot be removed and whereby the means for bolting cannot be removed without unshackling the shackling means, said locking means further including a gasket which is attached between said first and second plates and which is attached to the first plate substantially parallel to said hinge.

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**4,313,322**

## STRAIGHTENING MACHINE FOR METAL PLATE AND STRIP

**Hans Malinowski, and Klaus P. Pielsticker, both of Dusseldorf, Fed. Rep. of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany**

**Filed Nov. 27, 1979, Ser. No. 97,801**

**Claims priority, application Japan, Jun. 1, 1979, 54/6754**

**Int. Cl.³ B21D *1/02***

**U.S. Cl. 72—164** **7 Claims**

1. A straightening machine for straightening metal plate and strip, the machine comprising

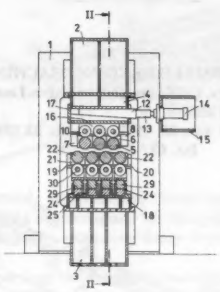
a frame on either side of the machine,

cross-members rigidly connecting the frames,

an upper set and a lower set of straightening rollers arranged between the cross-members to define a gap between them for a workpiece to be straightened,

a plurality of back-up rollers spaced along the length of each straightening roller,

back-up roller bearing supports, each support supporting a plurality of rollers, wherein each support supporting rollers associated with one of the sets of straightening rollers extends in the direction of material feed through the machine and supports back-up rollers of different straightening rollers, and each support supporting rollers associated with the other of the sets of straightening rollers extend at right angles to the direction of material feed and supports back-up rollers all of the same straightening roller,



a displaceable wedge means for moving each of the bearing supports towards the roll gap, and

biassing means for biassing the straightening rollers, back-up rollers and bearing supports away from the roll gap against the wedge means.

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**4,313,323**

## METHOD FOR MANUFACTURING POLY-V PULLEYS

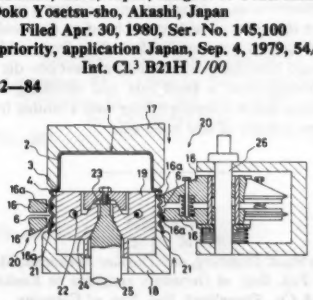
**Yukio Kanemitsu, Kobe, Japan, assignor to Goshi Kaisha Kanemitsu Doko Yosetsu-sho, Akashi, Japan**

**Filed Apr. 30, 1980, Ser. No. 145,100**

**Claims priority, application Japan, Sep. 4, 1979, 54/113820**

**Int. Cl.³ B21H *1/00***

**U.S. Cl. 72—84** **8 Claims**



1. An improved method for manufacturing a poly-v pulley for use with a poly-V belt, from a cup-shaped blank having a substantially cylindrical flange wall, comprising the steps of:

corrugating the flange wall to form a plurality of roughly dimensioned grooves, innermost edges of the grooves defining an inner surface of the flange wall;

axially compressing the corrugated flange wall between a pair of press forms; and,

pressing a rotatable finishing roller into each of the compressed grooves of the corrugated flange wall to form a plurality of poly-V grooves of predetermined shape;

wherein the improvement comprises the steps of:

supporting the flange wall from the inside, during the axial compression, by an inner form having an even outer

surface which contacts the inner surface of the flange wall;

supporting the flange wall from the outside during the axial compression by inserting an auxiliary roller into each of the grooves in the outer surface of the flange; and,

allowing the auxiliary rollers to move axially so as to remain in engagement with the grooves as the flange wall is compressed.

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**4,313,324**

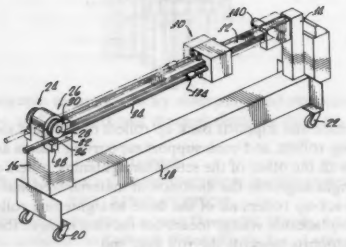
**REVERSIBLE BENDING MACHINE**

**John Pearson, Vista, Calif., assignor to Eaton-Leonard Corporation, Carlsbad, Calif.**

**Filed Apr. 25, 1979, Ser. No. 33,158**

**Int. Cl.³ B21D *7/04***

**U.S. Cl. 72—149** **11 Claims**



1. A reversible bending machine comprising

a bending head having first and second sets of bending dies,

a carriage for moving an elongated workpiece in a direction toward said bending head, and

means for supporting said carriage for pivotal motion relative to said bending head about a carriage axis extending in said direction so as to selectively position a workpiece at one or the other of said sets of bending dies said carriage including a workpiece holder offset from said carriage axis, said bending dies including at least one die mounted for motion about a bend axis, and including means for mounting said workpiece holder with a limited freedom of motion radially of said bend axis.

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**4,313,325**

**PUSH BENCHES**

**Karl-Hans Staat, Homberg, and Theodor Zacharias, Meerbusch, both of Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Dusseldorf, Fed. Rep. of Germany**

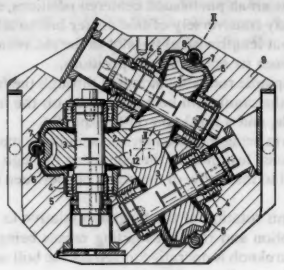
**Filed Oct. 11, 1979, Ser. No. 83,775**

**Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2848990**

**Int. Cl.³ B21B *17/04***

**U.S. Cl. 72—208** **5 Claims**

1. A push bench for the production of tube blooms having a plurality of roll stands arranged one behind the other in the direction of pushing, of which at least the last said roll stands participating in reduction of the tube bloom have radially adjustably supported rolls, each said roll stand having radially adjustably supported rolls comprising a roll housing, a plurality of rolls in said housing surrounding a pass line, a mandrel rod for insertion centrally of said pass line and means in said housing moving each of said plurality of rolls radially relatively to a mandrel rod each time a mandrel is inserted in the pass in accordance with measurements of said mandrel diameter made prior to insertion whereby said rolls are maintained at



a preselected radial distance from the periphery of said mandrel rod.

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**4,313,326**

**CONTINUOUS ROLLING LINES AND METHODS FOR ROLLING WIRES OR BARS**

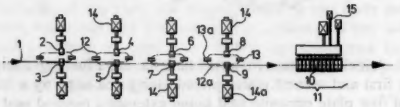
**Ali Bindernagel, Wermelskirchen, and Ernst O. Blos, Hochdahl, both of Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Düsseldorf, Fed. Rep. of Germany**

**Filed Apr. 28, 1980, Ser. No. 144,384**

**Claims priority, application Fed. Rep. of Germany, Jun. 21, 1979, 2924954**

**Int. Cl.³ B21B *1/18***

**U.S. Cl. 72—230** **5 Claims**



1. A continuous rolling line for the hot rolling of wire or bars, particularly of alloy steels and difficulty deformable metals and/or alloys comprising at least one repeater rolling unit of at least two stands receiving metal for rolling, an adjustable rolled stock loop incorporated between said at least two stands of said repeater rolling unit, and at least one multi-stand continuous rolling block unit spaced from said repeater rolling unit receiving rolled stock directly from said rolled stock loop of the repeater rolling unit in a traction and compression free manner and forming the exit section of said lines.

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**4,313,327**

**EXTRUSION DIE FOR FORMING MULTI-PASSAGE TUBULAR MEMBERS**

**Joseph M. O'Connor, Chicago, Ill., assignor to Peerless of America, Inc., Chicago, Ill.**

**Filed Dec. 31, 1979, Ser. No. 108,810**

**Int. Cl.³ B21C *23/08***

**U.S. Cl. 72—265** **10 Claims**

1. An extrusion die for the extrusion of an elongated multi-passageway tubular member having a partition wall disposed between two adjacent, longitudinally extending passageways, said die comprising

a. a body portion,

b. a die plate

(1) mounted on one side of said body portion, and

(2) having an opening extending therethrough,

c. a core

(1) mounted on said body portion, and

(2) having a portion disposed in said opening in spaced

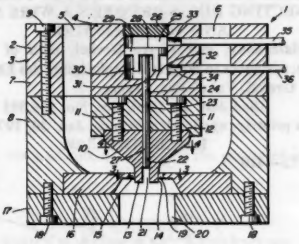
relation to said die plate in position to define an annular passage through said opening in said die plate

d. said portion of said core having another passageway

(1) opening outwardly therethrough away from said body portion, and

(2) extending transversely thereacross for interconnecting opposite sides of said first mentioned passageway, and

e. said body portion having passage means therein for feeding tube-forming material therethrough into surrounding



relation to said portion of said core for passage outwardly from said die plate through said first mentioned and other passageways to thereby form an extruded, elongated tubular member having a longitudinally extending, internal partition wall disposed between two adjacent, longitudinally extending passageways, and

f. means mounted in said core for interrupting the flow of said tube-forming material through said other passageway and thereby forming an opening through said partition wall.

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4,313,328

## PROVIDING CARDAN AND UNIVERSAL JOINT-TYPE SHAFTS WITH GEARING

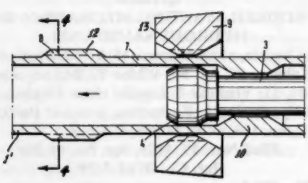
Manfred Janssen, Krefeld; Karl Austermann, Duesseldorf, and Volker Schmidt, Muelheim, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 20, 1980, Ser. No. 161,354

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1979, 2925927

Int. Cl.[3] B21C *37/20*

U.S. Cl. 72—276 2 Claims



1. Method of providing universal, joint-type or cardan shafts with gearing, comprising the steps of:

providing a tubular blank with local, annular, radially inwardly and/or radially outwardly extending protrusions; and

imparting upon the protrusions gear profiles by means of drawing under utilization of a plug and of an annular drawing die, radially aligned with the plug, at least one of the dies and the plug being configured for gear drawing.

4,313,329

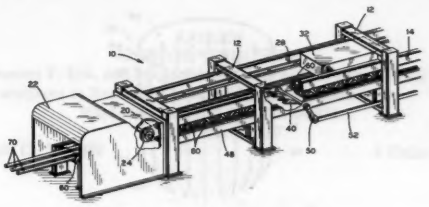
## UNLOADING APPARATUS

Robert D. Caswall, Jr., and George W. Kaase, both of Perrysburg, Ohio, assignors to Abbey-Etna Machine Company, Perrysburg, Ohio

Filed Dec. 5, 1979, Ser. No. 100,428

Int. Cl.[3] B21C *1/27, 1/32, 35/00*

U.S. Cl. 72—290 5 Claims



1. A horizontal, longitudinally extending drawbench for producing lengths of stock material, comprising:

(a) a longitudinally extending frame having a longitudinal axis;

(b) a draw carriage longitudinally movably mounted on said frame for drawing said stock material from a shaping die and releasing the lengths of stock material;

(c) a longitudinally movable conveying means disposed directly beneath said draw carriage to move released lengths of stock material parallel with the longitudinal axis of said frame; and

(d) means disposed beneath said draw carriage in alignment with said conveying means for receiving and transferring the released lengths of stock material onto said conveying means.

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4,313,330

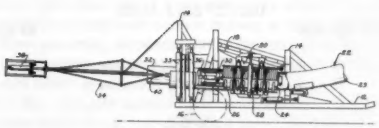
## PIPE BENDING APPARATUS

James D. Cummings, Rte. 2., Box 22, San Marcos, Tex. 78666

Filed Mar. 10, 1980, Ser. No. 128,576

Int. Cl.[3] B21D *9/05*

U.S. Cl. 72—307 11 Claims



1. In an apparatus for bending pipe of the type having a housing section and an upper bending die connected to the housing section, the combination comprising:

a pair of flexible, external bending shoe assemblies carried by said housing and adapted for engaging the outer surface of a portion of the pipe to be bent;

a flexible mandrel aligned between said external bending shoe assemblies, said mandrel inserted into said pipe and adapted for engaging the inner surface of the portion of the pipe to be bent; and

a positioning assembly connected to said mandrel and said housing, said assembly arranged to accurately position the mandrel within the pipe and selectively position the pipe with respect to said apparatus.

4,313,331

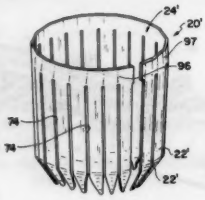
## METHOD OF MANUFACTURING A METALLIC RETAINING RING FOR A TUBE

Paul Mode, Westfield, N.J., assignor to Nycoil Company, Fanwood, N.J.

Division of Ser. No. 912,003, Jun. 2, 1978. This application Sep. 5, 1979, Ser. No. 72,663

Int. Cl.[3] B21D *53/36*

U.S. Cl. 72—368 8 Claims




1. A method of manufacturing a metallic retaining ring for a tube, the retaining ring having a plurality of axially extending inwardly biased gripping fingers, said method comprising the steps of:

cutting a flat metallic plate to form a flat web portion and a plurality of substantially parallel, laterally spaced elongated fingers depending from and integral with said flat web portion;

bending said fingers out of the plane of said web portion so that at least a portion of each of said fingers is inclined with respect to the surface of said web portion; and

bending said web portion around a substantially circular form so as to cause bending of said web portion at a plurality of locations along the lateral width of said web portion to form a multi-sided ring having a plurality of substantially straight side portions with adjacent side portions defining a plurality of corners.

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4,313,332

## ROTARY FORGING MACHINE

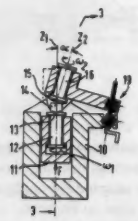
William A. Penny, Brockenhurst, and Robert A. C. Slater, London, both of England, assignors to The City University and The Worshipful Company of Pewterers, both of London, England

Filed Jan. 29, 1980, Ser. No. 116,542

Claims priority, application United Kingdom, Feb. 1, 1979, 03561/79

Int. Cl.[3] B21J *13/02*

U.S. Cl. 72—406 15 Claims




1. A rotary forging or upsetting machine comprising:

a machine frame for operatively positioning a plurality of machine elements;

a first platen and a second platen operatively disposed at an angle relative to each other within said machine frame;

means for operatively rotating both platens about independent intersecting axes relative to each other and said machine frame;

adjustment means for operatively adjusting the angle between the first and second platens while said platens are rotating; and

displacement means for applying a force to at least one platen to operatively move it towards the other platen.

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4,313,333

## PLIERS FOR POSITIONING CLIPS FORMING CONNECTING RINGS BETWEEN A WIRE NETTING AND SUPPORT WIRES

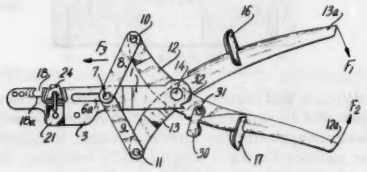
Roger Malagnoux, and Pierre Grehal, both of Val d'Oise, France, assignors to Societe d'Exploitation des Etablissements Pierre Grehal, Val d'Oise, France

Filed Jan. 30, 1980, Ser. No. 116,891

Claims priority, application France, Jan. 30, 1979, 79 02301

Int. Cl.[3] B21D *7/06*

U.S. Cl. 72—410 7 Claims




1. A device for positioning clips which form connecting rings between a wire netting and support wires, which comprises:

a first plate and a second plate forming the body of said device, each of said plates being provided with a recess;

a fixed spacer part interposed between a portion of one end of each of said plates;

a mobile part guidable between said plates, said spacer part having substantially the same thickness as said mobile part;

a pin displaceably journalled in said plates and rigidly connected to said mobile part;

actuating means for displacing said pin and guiding said mobile part, said actuating means including two arms pivotally interconnected near a front end thereof closest to said plates, and means for operatively connecting said front ends of said arms to said pin; and

a clip supply magazine mountable to said device for providing clips to one of said recesses to enable deformation of a clip between said mobile part and said fixed spacer part.

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4,313,334

## STRIKER STARTING MECHANISM OF HYDRODYNAMIC UNIT

Viktor N. Chachin, ulitsa Kulman, 15, kv. 91; Vladimir K. Kolos, ulitsa Kulman, 26, kv. 50; Viktor V. Botyan, ulitsa Lenina, 11/35, kv. 11; Vladimir I. Luzgin, ulitsa Plekhanova, 63, kv. 52, and Vyacheslav A. Kashperko, prospekt Partizansky, 28, korpus 2, kv. 134, all of Minsk, U.S.S.R.

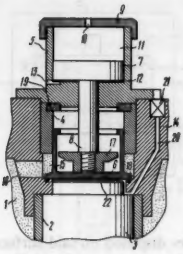
Filed Nov. 19, 1979, Ser. No. 95,390

Int. Cl.[3] B21J *7/28*

U.S. Cl. 72—453.1 3 Claims

1. A striker starting mechanism of a hydrodynamic unit, comprising: a shaft in which said striker is movable; a compressed gas receiver enveloping said shaft; a lid closing spaces of said receiver and said shaft; a control cylinder and a working cylinder arranged in series one after the other, each cylinder having a piston, said working cylinder being mounted in said lid, and a circular space defined by the end of said working cylinder and the end of said shaft and communicating with the space of said receiver; a rod interconnecting the pistons of said cylinders, the piston of said working cylinder being mounted

for movement relative to said rod; a compressed medium acting upon the piston of said control cylinder to set said piston in



motion and, via said rod, acting upon the piston of said working cylinder.

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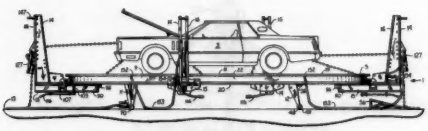
**4,313,335**
**VEHICLE WORK RACK STRUCTURE**
**Leonard F. Eck, McPherson, Kans., assignor to Kansas Jack, Inc., McPherson, Kans.**
**Filed Nov. 23, 1979, Ser. No. 96,758**
**Int. Cl.³ B21D *1/14*; B66F *7/16, 7/22***
**U.S. Cl. 72—457** **7 Claims**



**1.** A work rack for correcting misshapen vehicle frame and body portions comprising:

(a) a rack structure having a vehicle supportive upper surface and with generally continuous front end, rear end and opposite side rack portions having an outer perimeter margin and an inner margin, the inner margin forming an interior opening whereby a vehicle straddles said opening for work access to the vehicle underside;

(b) front and rear supportive foot members affixed to said rack structure for positioning said rack structure above a floor surface;

(c) at least one force applying structure having an elongate base extending under one of said rack portions and under said supportive upper surface and having outer and inner rollers secured to said base and respectively engaging said outer and inner rack margins and mounting said base to said rack structure for selectively free translation around said rack structure to a position for exerting a force on a selected area of said vehicle;

(d) said elongate base being substantially slung from said rack structure by said rollers and shiftable upwardly and downwardly relative thereto at selective locations around said rack structure upon application of force from said force applying structure;

(e) said force applying structure including a standard mounted on said base, upstanding therefrom and positioned outwardly of the rack structure outer margin; and a force applying means mounted on said force applying structure for operative connection to the vehicle to exert a force thereon and correct misshapen frame and body portions; said force applying means upon exerting a tensioning force on said vehicle, causing said force applying structure to swing slightly toward said vehicle and tilt said base to disengage said outer rollers from said outer rack margin and means mounted on said base for abutting said rack structure and for frictionally locking said force applying structure at a selective location around said rack structure upon tilting of said base.

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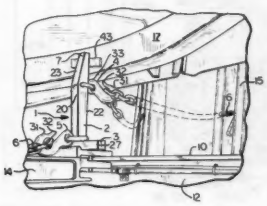
**4,313,336**
**ANCHOR STRUCTURE**
**Leonard F. Eck, and Michael Lamb, both of McPherson, Kans., assignors to Kansas Jack, Inc., McPherson, Kans.**
**Filed Oct. 15, 1979, Ser. No. 84,874**
**Int. Cl.³ B21D *1/14***
**U.S. Cl. 72—458** **3 Claims**



**1.** An anchor structure for exerting force against vehicle structural members during straightening operations thereof and comprising:

(a) a generally upstanding bar member having an upper end portion, an intermediate portion and a bottom end; said bar member being of a rigid material to resist bending forces applied thereto;

(b) a base member rigidly secured to said bottom and extending laterally therefrom in a transverse direction to a direction of pull for resting upon a supportive surface, said base member being elongate in shape to form an inverted T-shaped structure with said bar member whereby said bar member and said base member rock forwardly and rearwardly on said supportive surface;

(c) a lower attachment hook swingably secured to said bar member at said bottom end and upward of said base member and extending therefrom generally perpendicular to a long direction of said base member;

(d) an upper attachment hook swingably secured to said bar member at said intermediate portion and extending therefrom generally perpendicular to the long direction of said base member and opposite to the direction of extension of said lower attachment hook;

(e) a first elongate tension member connected to said lower attachment hook and extending away therefrom in a direction opposite to the desired direction of pull, said first tension member having a remote end for securing to an anchor spaced from said bar member and preventing outward movement of base member away from said anchor; and

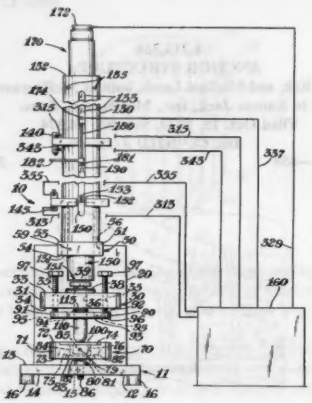
(f) a second elongate tension member connected to said upper attachment hook and extending away therefrom in the desired direction of pull, said tension member having a remote end portion for securing to a pulling means spaced from said bar member whereby said pulling means is operable to exert a pulling force on said second tension member and swing said bar member upper end portion theretoward, said upper end portion being engageable against a vehicle structural member to exert a pulling force thereon.

**4,313,337**

## APPARATUS FOR EVALUATING THE IMPACT RESISTANCE OF SYNTHETIC RESINOUS PRODUCTS

U. Hla Myint, Kowloon, Hong Kong, assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 17, 1980, Ser. No. 130,756
Int. Cl.³ G01N 3/34
U.S. Cl. 73—12 8 Claims



1. An improved impact testing apparatus of the type used for the evaluation of synthetic resinous products or test pieces in which a support means serves as a base in cooperative combination with a peripherally supporting sample support means, a slidably supported sample impacting means which is oriented generally normal to the sample support means, and a means for varying the height to which the sample impacting means is raised and dropped thereby imparting an impact energy to an impact region of a test piece, said impact region being a generally central unsupported surface portion of the test piece, and repeatedly imparting the impact energy until failure of the test piece occurs, wherein the sample support means is a ring pedestal which is connected to the support means and a peripherally supporting reversible sample receiving means having a first end and an opposing second end, the peripherally supporting reversible sample receiving means being supported by the ring pedestal so as to define a first support diameter when the first end of the peripherally supporting reversible sample receiving means is remote from the ring pedestal and a second support diameter when the second end of the peripherally supporting reversible sample receiving means is remote from the ring pedestal.

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**4,313,338**

## GAS SENSING DEVICE

Atsushi Abe, Ikoma; Hisahito Ogawa, Katano; Masahiro Nishikawa, Amagasaki; Satoshi Sekido, Yahata, and Shigeru Hayakawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

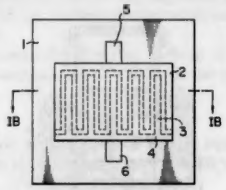
Filed Aug. 14, 1979, Ser. No. 66,332
Claims priority, application Japan, Aug. 18, 1978, 53/101100; Aug. 18, 1978, 53/101101; Aug. 23, 1978, 53/103026
Int. Cl.³ G01N 27/12
U.S. Cl. 73—23 18 Claims

1. A gas sensing device comprising:

a substrate of an electrically insulating material,

a film deposited on one surface of said substrate, said film being comprised of an aggregate of ultrafine particles having a mean diameter of between about 10 and several hundred angstroms and a resistance of said film varying as a function of the pressure of a gas to be detected,

a heating means for heating said film to a predetermined temperature in accordance with the gas to be detected, and



a pair of electrodes disposed on said surface of the substrate for measuring the resistance of said film.

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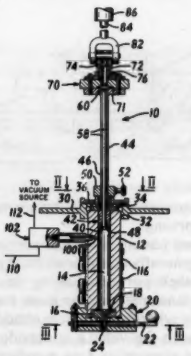
**4,313,339**

## RHEOMETER AND RHEOLOGICAL MEASURING METHOD

Walter A. Nichols, Richmond, and George L. Mathe, Bon Air, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Mar. 19, 1980, Ser. No. 131,745
Int. Cl.³ G01N 11/04
U.S. Cl. 73—56 22 Claims



13. A method of measuring the rheological properties of a material comprising the steps of:

(a) loading the material to be tested into a chamber having a discharge orifice;

(b) occluding the discharge orifice to retain the material within the chamber and mixing the material while it is so retained; and

(c) forcing the mixed material out of the chamber through the discharge orifice in a controlled manner and monitoring the discharge to determine the rheological properties.

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**4,313,340**

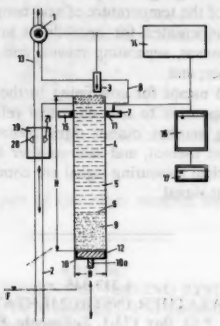
## DEVICE FOR MEASURING THE SOLIDS CONTENT OF A LIQUID

Manfred Schniewind, Essen, Fed. Rep. of Germany, assignor to Ihle Ingenieurgesellschaft mbH, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 8, 1980, Ser. No. 119,956
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1979, 2913058
Int. Cl.³ G01N 15/04
U.S. Cl. 73—61.4 22 Claims

1. In a device for the automatic measurement of the settlable solids content of a liquid including a light transparent vertical

measuring tube, a pump for filling said measuring tube with the liquid, and a photoelectric scanning head for finding the position of the boundary layer of the deposited solids, the improvement comprising a piston disposed in said measuring tube and adapted to displace said liquid contained in said measuring tube upward.

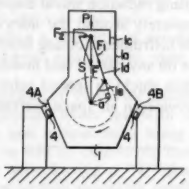


4,313,341

## TORQUE DETECTING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Hiroaki Yamaguchi, Anjo; Tadashi Hattori, and Yoshinori Ootsuka, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 5, 1979, Ser. No. 100,325
Claims priority, application Japan, Dec. 7, 1978, 53-152335; Sep. 28, 1979, 54-126217
Int. Cl.³ G01L 3/02
U.S. Cl. 73—862.33 3 Claims



1. A torque detecting device for internal combustion engines comprising:

pressure detecting means including piezo-electric elements arranged between an engine body and a plurality of portions of an engine support respectively for detecting the torque by the pressure difference between said portions in order to absorb the vertical vibrations of said engine body; and

an electrical circuit responsive to said pressure detecting means including means for storing electric charges generated in said piezo-electric elements, means for controlling the amount of charges stored in said storing means, and means for determining the change in charges stored in said storing means at predetermined cycles.

4,313,342

## METHOD AND APPARATUS FOR DETERMINING VERTICAL HEAT FLUX OF GEOTHERMAL FIELD

Heinz F. Poppendiek, LaJolla, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 11, 1980, Ser. No. 129,433
Int. Cl.³ E21B 49/00
U.S. Cl. 73—154 13 Claims

1. A method of determining the earth's vertical heat flux using a borehole in a location of interest, comprising the steps of

positioning in said borehole, at a depth of interest, a first elongated heat-flux transducer having a known thermal conductivity,

maintaining said first transducer in position for a period sufficient to reach thermal equilibrium with its surroundings, said first transducer being thermally coupled to the earth primarily only through a fluid annulus,

sensing the thermal gradient along said first transducer,

positioning in said borehole at said depth of interest a second elongated heat-flux transducer having a known thermal conductivity different from that of the first transducer,

maintaining said second transducer in position for a period sufficient to reach thermal equilibrium with its surroundings, said second transducer being thermally coupled to the earth primarily only through a fluid annulus,

sensing the thermal gradient along said second transducer, and

relating the thermal gradient sensed along said first transducer and the thermal conductivity of said first transducer to the thermal gradient sensed along said second transducer and the thermal conductivity of said second transducer to determine the vertical heat flux at the location and depth of interest.

4,313,343

## APPARATUS FOR DETECTING REMAINING QUANTITY OF TONER IN ELECTROPHOTOGRAPHIC COPYING MACHINE

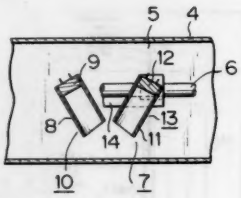
Isao Kobayashi; Hideo Akimoto; Yoshiyuki Takahashi; Tokio Hibiya, and Masayuki Hata, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1979, Ser. No. 59,134
Claims priority, application Japan, Jul. 24, 1978, 53-89489
Int. Cl.³ G01F 23/28; G03G 15/00
U.S. Cl. 73—290 V 7 Claims

1. Apparatus for detecting the level of particulate toner contained in a toner supply hopper of an electrophotographic copying machine so as to enable toner replenishment to the hopper when the level recedes to a predetermined point, said apparatus comprising:

transmitting means disposed in the toner hopper for generating an ultrasonic acoustic wave;

receiving means disposed in the toner hopper and in operative relation to said transmitting means for receiving the wave generated by said transmitting means after reflection from toner contained in the hopper and for producing a signal in representative accordance with the received wave; and




circuit means connected to said receiving means for converting said signal into an indication of the level of toner contained in the hopper, said transmitting and receiving means being so disposed in the hopper that the toner contained therein covers at least a portion of said transmitting and receiving means when the level of toner is at a maximum and said transmitting and receiving means are uncovered when the level of toner has receded to the predetermined point for replenishment.

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**4,313,344**

## FIBER OPTICAL TEMPERATURE MEASUREMENT DEVICES

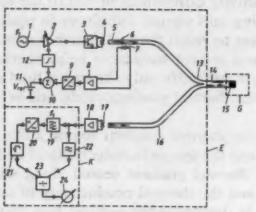
**Torgny Brogardh, and Lars Sander, both of Vesteras, Sweden, assignors to Asea Aktiebolag, Vesteras, Sweden**

**Filed Nov. 30, 1979, Ser. No. 98,844**

**Claims priority, application Sweden, Dec. 5, 1978, 7812480**

**Int. Cl.³ G01J *5/28***

**U.S. Cl. 73—355 R** **15 Claims**



1. Fiber optical measuring device for measuring the temperature of a temperature sensitive object, comprising:

means for radiating light;

a transducer reflecting light from said means for radiating light and including said temperature sensitive object emitting temperature induced radiation, said reflected light and said emitted radiation respectively representing a reference signal and a measuring signal and forming a composite signal;

detector means for detecting said composite signal and providing a composite output signal;

separating means responsive to said composite output signal for separating said reference signal and said measuring signal to produce an electrical reference signal and an electrical measuring signal, respectively;

at least one optical fiber for interconnecting said means for radiating light and said transducer, and for interconnecting said detector means and said transducer to transmit said composite signal;

means for combining said electrical reference and said electrical measuring signal to provide an output signal representative of the temperature of said temperature sensitive object compensated for instabilities in said transducer, detector means, separating means, and said at least one optical fiber; and

wherein said means for combining further includes circuit means responsive to said electrical reference signal for generating another output signal representative of the square root thereof, and said another output signal and said electrical measuring signal are combined to produce said output signal.

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**4,313,345**

## OUTDOOR WEATHER INSTRUMENTATION STATION

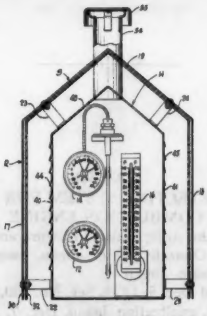
**Alan C. Abele, P.O. Box 173-1, Zelienople, Pa. 16063**

**Division of Ser. No. 18,737, Mar. 8, 1979, Pat. No. 4,233,841.**

**This application Jun. 2, 1980, Ser. No. 155,613**

**Int. Cl.³ G01D *11/24***

**U.S. Cl. 73—431** **16 Claims**



1. An outdoor weather instrumentation station comprising, an instrument housing adapted to receive at least one weather instrument therein, a weather instrument disposed in said housing, an exterior housing radiation shield disposed over the roof and down and completely around the sides of the instrument housing to shield the instrument housing from the sun such that the sun cannot shine on any part of said housing, and means for securing the radiation shield in spaced relation to the instrument housing to provide an air space therebetween.

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**4,313,346**

## ACCELEROMETERS

**Norman F. Shillam, Farnborough, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England**

**Filed Mar. 3, 1980, Ser. No. 126,255**

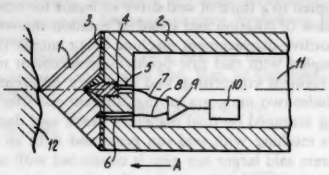
**Claims priority, application United Kingdom, Mar. 1, 1979, 07291/79**

**Int. Cl.³ G01P *15/08***

**U.S. Cl. 73—517 R** **5 Claims**

1. An accelerometer including a thermocouple circuit which comprises a movable member and a second member, part of said second member abutting a part of said movable member, wherein abutting parts of said members include a cutting portion and wherein said parts are composed of dissimilar metals,

and recording means connected to the members for recording a thermoelectric signal generated when said cutting portion



cuts the abutting part of said other member during acceleration.

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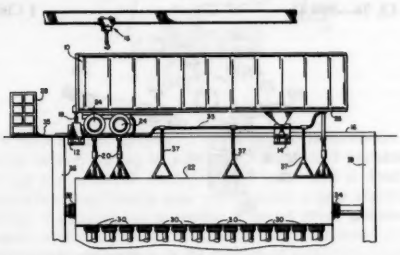
4,313,347

## ENVIRONMENTAL TESTING SYSTEM

Frederick H. Hull, Ft. Washington, Pa., assignor to The Budd Company, Troy, Mich.

Filed Apr. 7, 1980, Ser. No. 137,729
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—669 8 Claims



1. An environmental testing system for a product comprising:

(a) a seismic mass;

(b) a series of mounts having air cushioning means thereon for supporting said seismic mass:

(c) a pit having a floor, a pair of side walls and a pair of end walls for receiving said seismic mass therein said mounts being connected between said seismic mass and said floor, said side walls and said end walls;

(d) means including a plurality of actuators adapted to be connected between said seismic mass and said product under test;

(e) means including servo valves for driving said actuators to vibrate said product under test with the reaction forces generated by said seismic mass being absorbed by said seismic mass on said air cushioning means; and

(f) said seismic mass having a "T" shaped cross section including a top section extending parallel to said floor of said pit and a leg section extending downwardly from the center of said top section towards said floor of said pit whereby said seismic mass is supported on said air mounting means at its center of gravity.

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4,313,348

## METHOD OF STRESS GRADING TIMBER LENGTH

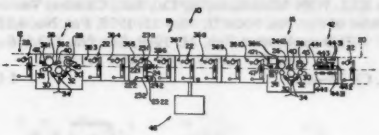
Borge S. Madsen, North Vancouver, Canada, assignor to South African Inventions Development Corp., Pretotia, South Africa

Filed Apr. 25, 1980, Ser. No. 143,962
Claims priority, application South Africa, May 2, 1979, 79/2112
Int. Cl.³ G01N *3/20*
U.S. Cl. 73—852 15 Claims

1. A method of stress-grading a timber length in terms of its load-bearing ability when loaded as a simple beam, which comprises

measuring the minimum stiffness of the timber length;

measuring the clear stiffness of the timber length; and



using the independent predictors constituted by said minimum stiffness and said clear stiffness in conjunction to classify the timber length into a particular grade according to its load-bearing ability when loaded as a simple beam.

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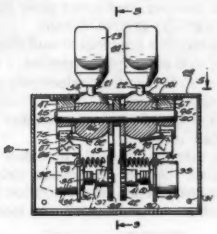
4,313,349

## SEALED ELECTRICAL CONTROL DEVICE FOR X-RAY APPARATUS

Christopher J. Heitman, Milwaukee, and Joseph A. Becker, Waukesha, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1980, Ser. No. 109,022
Int. Cl.³ G05G *1/04*
U.S. Cl. 74—507 5 Claims



1. A device for controlling an x-ray beam collimator comprising:

a frame member for being mounted in a fixed position,

an element having a spherical surface, said element being supported from the frame member for rotation relative to said member and a manually engageable lever extending from said element for rotating said element,

first gear means rotatable with said spherical element about the rotational axis of said element,

pivotally mounted bracket means and a potentiometer mounted on said bracket means, said potentiometer having an operating shaft extending from it,

second gear means fastened to the potentiometer shaft for meshing with said first gear means when said pivotal bracket means is in one of its angular positions and for being unmeshed when said bracket means is in other of its angular positions,

spring means for urging said bracket means into a position where said gear means are caused to mesh,

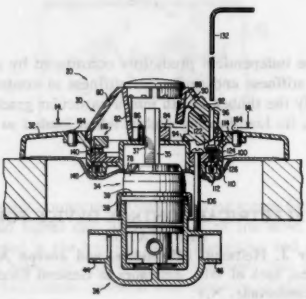
a wall member on which said frame member is supported, said wall member having a hole into which the spherical surface of said element protrudes and through which said operating lever extends, and a pliant generally planar element interposed between said frame member and wall member, said pliant element having a hole through which said lever extends and which provides a marginal region around said hole that is deflected by said protruding spherical surface to form a lip seal therewith.

4,313,350

## ANTI-SCALD APPARATUS FOR A TUB AND SHOWER SINGLE CONTROL FAUCET

Robert J. Keller, III, Chester, Va.; Brian G. Fox, Dover Center, and Benjamin A. Korec, Cambridge, both of Canada, assignors to KEL-WIN Manufacturing Co., Inc., Chester, Va.

Division of Ser. No. 906,072, May 15, 1978, Pat. No. 4,220,175.
This application Feb. 21, 1980, Ser. No. 123,156
Int. Cl.[3] G05G *1/08*; F16K *51/00*
U.S. Cl. 74—526 4 Claims



1. In an anti-scald apparatus for a tub and shower single control faucet, the combination which comprises

a. a cover plate member, said cover plate member having a substantially circular groove therein,

b. a slotted ring member received in said substantially circular groove of said cover plate member,

c. a plurality of stop members selectively positionable on said slotted ring member,

d. means to orient said slotted ring member with respect to said cover plate member,

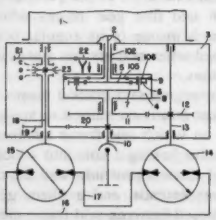
e. and a handle member rotatably mounted with respect to said cover plate member and means extending through said handle member to adjust the position of a least one of the stop members on said slotted ring member.

4,313,351

## MULTIPLE-POWER GEAR DRIVE TRANSMISSION AND DRIVE ASSEMBLY INCLUDING SUCH TRANSMISSION, AND BRAKE ENERGY ACCUMULATOR

Faust Hagin, Munich, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 6, 1979, Ser. No. 18,357
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1978, 2810086
Int. Cl.[3] F16H *47/04*, *37/06*
U.S. Cl. 74—687 19 Claims



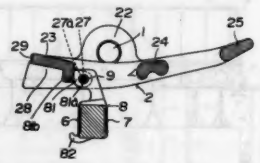
1. In a multiple-power gear drive transmission comprising a planetary differential gear drive including at least first, second and third drive elements; a gear drive input shaft connected with at least one of said drive elements; a gear drive output shaft connected with another of said drive elements; a first positive-displacement machine operable in both directions being coupled to a third of said drive elements for controlling the direction of rotation and speed of rotation thereof; and a second positive-displacement machine being energy-transmissively coupled with said first positive-displacement machine; the improvement comprising said planetary differential gear drive includes two sun gears having different diameters; a web gear being arranged on dual planetary gears, said dual planetary gears meshing with said sun gears and with an internal gear wherein said larger sun gear is connected with said gear drive input shaft; and shift couplings for selectively connecting said second positive-displacement machine in dependence upon the speed of rotation of said gear drive output shaft with either said gear drive output shaft or with the smaller sun gear.

4,313,352

## PEDAL FOR A BICYCLE

Shinpei Okajima, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Nov. 2, 1979, Ser. No. 90,856
Claims priority, application Japan, Nov. 11, 1978, 53-155527[U]
Int. Cl.[3] G05G *1/14*
U.S. Cl. 74—594.4 1 Claim



1. A pedal for a bicycle, which is supported rotatably to a crank arm, said pedal comprising:

a pedal shaft;

a pedal body supported rotatably to said crank arm through said pedal shaft, said body being vertically displaced at the center downward with respect to said shaft, and said pedal body being provided at an upper surface thereof and at both sides of said pedal body longitudinally of the bicycle with at least first and second foot bearing surfaces and at a portion lower than said foot bearing surfaces with bearings for journaling a support;

a support having at one end reflectors and being supported swingably to said pedal body at a portion between said foot bearing surfaces by said bearings at a remaining end of said support, said support being adapted to swing between a position where said support is substantially vertical with respect to a plane including said first and second foot bearing surfaces, projecting downwardly from a lower surface of said pedal body, and a position where said support is substantially horizontal with respect to said plane, said support being restricted in one rotational direction by an abutment on said bearings which engages a continuous portion of said first foot bearing surfaces when said support is vertical;

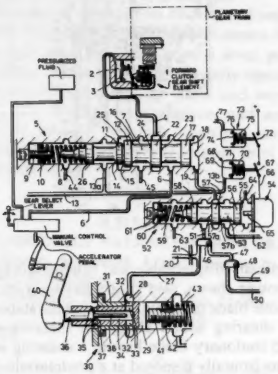
under said first surface a receiving chamber for receiving said support when said support is horizontal to said plane; and

a retaining means located on one of said pedal body and support, a remaining of said pedal body and support being provided with an engaging means for receiving said retaining means only when said support swings into a horizontal plane, said engaging and retaining means being disengageable releasing said support to assume a vertical orientation.

## 4,313,353
## CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION

**Ernst-August Honig, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany**

**Filed Oct. 10, 1979, Ser. No. 83,383**
**Claims priority, application Fed. Rep. of Germany, Oct. 13, 1978, 2844665**
**Int. Cl.³ B60K *41/04, 41/10***
**U.S. Cl. 74—868** **8 Claims**



1. In a control system for an automatic transmission of a motor vehicle having an accelerator pedal, said transmission having a mechanical planetary gear train with at least one hydraulically actuatable gear shift element, a gear select lever having a plurality of selectable forward drive positions, a source of first pressurized hydraulic fluid, a manual control valve means, responsive to the position of said lever, for delivering said first fluid to a selected gear shift element when said lever is in one of said forward drive positions, and a main control valve, responsive to the position of said accelerator pedal and the speed of said vehicle, for controlling the supply of said first fluid from said manual control valve to said selected element, said main control valve comprising a piston having a first piston surface, said piston being displaceable between a first position for connecting said supply of first fluid and a second position for interrupting said supply of first fluid, spring means acting on said piston, and means communicating with said main control valve for delivering an accelerator pedal position-dependent second fluid pressure for acting on said first piston surface in opposition to said spring means, wherein upon release of said accelerator pedal said second fluid pressure is reduced such that said spring means moves said piston into said second position; the improvement wherein said piston has a second piston surface opposed to said first piston surface, and means for providing a vehicle speed-dependent third fluid pressure for acting on said second piston surface in opposition to said accelerator pedal position-dependent pressure only when said piston is in said second position.

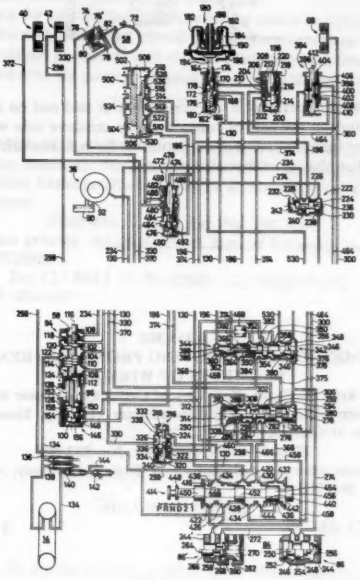
## 4,313,354
## DOWNSHIFT VALVE IN HYDRAULIC TRANSMISSION CONTROL SYSTEM

**Kazuyoshi Iwanaga, Yokohama; Kazuhiko Sugano, Tokyo, and Kunio Ohtsuka, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Nov. 8, 1978, Ser. No. 958,925**
**Claims priority, application Japan, Aug. 30, 1978, 53-105898**
**Int. Cl.³ B60K *41/10, 41/06***
**U.S. Cl. 74—869** **6 Claims**

1. A downshift valve in a hydraulic control system for an automatic power transmission in which the hydraulic control system includes at least one shift valve which is responsive to a governor pressure variable with vehicle speed and a throttle pressure variable with engine load and which is operable between a lower gear ratio condition and a higher gear ratio condition depending upon the relationship between the governor pressure and the throttle pressure, comprising

a valve element which is constantly communicated with and exclusively responsive to the governor pressure and the



throttle pressure and movable into and out of a predetermined position providing communication between said shift valve and a source of said throttle pressure for forcing the shift valve to be in said lower gear ratio condition thereof, the governor pressure being effective to urge the valve element to move away from said predetermined position of the valve element; and

biasing means urging the valve element to move toward said predetermined position thereof.

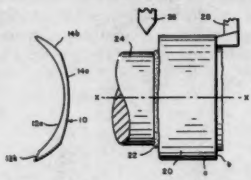
## 4,313,355
## METHOD AND APPARATUS FOR MANUFACTURING PLASTIC LENSES

**Ronald K. Becker, Arlington, and Donald R. Korb, Boston, both of Mass., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.**

**Division of Ser. No. 875,394, Feb. 6, 1978, Pat. No. 4,202,226.**
**This application Oct. 19, 1979, Ser. No. 86,470**
**Int. Cl.³ B23B *1/00, 5/40***
**U.S. Cl. 82—1 C** **16 Claims**

1. The method of making contact lenses comprising supporting a lens blank at one end for rotation about a predetermined axis, turning the side surface of the blank down to a true cylinder of predetermined diameter, facing the distal end of the blank in a plane perpendicular to the axis of rotation to form an annular surface of predetermined radial width, generating a concave surface at said end of predetermined depth at the center with respect to the plane of the annular surface leaving a predetermined portion of said annular surface intact, reversing the blank, generating a convex surface at the opposite end

on a radius centered on the axis of rotation at the concave side of the blank corresponding to the depth of the concave surface plus the thickness at the center of the lens to be made and



thereafter generating a convex surface at said end on a radius centered on the axis of rotation at the concave side which is greater than the radius of curvature of the concave surface and less than that of said convex surface.

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**4,313,356**

## METHOD OF REMOVING FRONT AND REAR SEGMENTS OF WIRE ROD

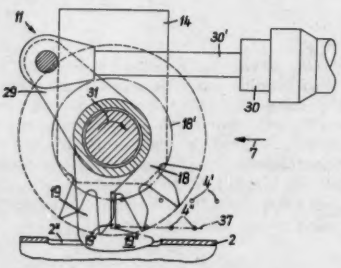
**Gerd Artz, Ratingen, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany**

**Filed Mar. 20, 1980, Ser. No. 132,302**

**Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917305**

**Int. Cl.³ B21F *11/00***

**U.S. Cl. 83—37** **6 Claims**



1. A method of removing front and rear segments of a rolled wire which is fed in the form of winding packages to a collecting device and is subdivided by separating procedures into good and scrap windings, said method including the steps of:

spirally placing the windings of successive winding packages around a guide element;

transporting said windings parallel to the longitudinal extension of said guide element;

continuously and repeatedly separating the scrap windings of the front and rear segments of respective winding packages in such a way that said separated scrap windings drop from said guide element; and

temporarily hindering participation of a respective good winding and a respective scrap windings of a rear segment in their transport movement toward said collecting device for the purpose of separating a respective scrap winding from the windings.

**4,313,357**

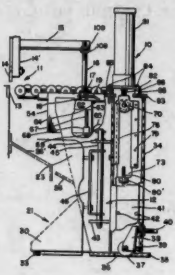
## WORKPIECE SUPPORT AND DISCHARGE SYSTEM FOR POWER SQUARING SHEARS

**Paul F. Hawkins, Greensboro, N.C., assignor to Wysong & Miles Company, Greensboro, N.C.**

**Filed May 15, 1980, Ser. No. 150,006**

**Int. Cl.³ B26D *7/27***

**U.S. Cl. 83—81** **18 Claims**



1. A vertically displaceable and tiltable workpiece support table for power shears, said shears having a stationary blade and a movable blade movable relative to the stationary blade to provide a shearing action along the shearing edges of said blades, said stationary blade having a shearing edge which is normally horizontally disposed at a predetermined level, comprising a displaceable table top, a frame for supporting said displaceable table top on the back side of the power shears with the table disposed rearwardly of the stationary blade and normally in a level position at substantially the same level as the shearing edge of said stationary blade, said frame including a pair of horizontally spaced upright side members each having an inner vertically disposed planar surface which is parallel to and faces the planar surface of the other upright member, a pair of vertically displaceable brackets, one of said brackets being supported on each of said planar surfaces, each of said brackets having a horizontally disposed roller receiving track section, and a vertically disposed roller receiving track section,

first roller means rotatably mounted adjacent the inner planar surface of each of said side members and disposed in the vertically disposed roller receiving track section of one of said vertically displaceable brackets for guiding said bracket in vertical displacement between predetermined upper and lower limits,

said table top having a top work support surface, a front, a back, and parallel opposite sides connecting said front and back,

second roller means rotatably mounted on each of the opposite sides of said table top, said second roller means being spaced at equal distances from the front of said table and closer to the front than to the back, said second roller means on each side of said table top being received in the horizontally disposed roller receiving track section of one of the vertically displaceable brackets and movably guided therein,

vertical guide ways on each side of said frame rearwardly of said vertically displaceable brackets, rear table support means journalled on each side of said table adjacent said back,

the rear table support means on each side of said table being engaged in an adjacent one of said vertical guide ways for vertical reciprocation between upper and lower limits, the lower limit of movement of said rear table support means being substantially lower than the lower limit of movement of the horizontal track sections of said vertically displaceable brackets whereby the rear portion of said table top is displaceable downwardly a greater distance from the normal level position of said table top than the

distance which the front portion of said table top is displaceable so that the table top tilts down rearwardly when the rear portion of said table top is displaced downwardly a greater distance than the front portion of said table top,

means equalizing the vertical movement of said rear table support means in said vertical guide ways on the opposite sides of said frame,

actuating rod means connectable between the movable blade of said shear and said vertically displaceable brackets for depressing said vertically displaceable brackets and consequently said table top downwardly as said movable blade descends for shearing a workpiece, and

power lifting means mounted on each side of said frame and connected with said rear table support means for normally holding said table top in its normal level position, said power lifting means being automatically operable to permit descent of said table top when said movable shear descends for shearing a workpiece, and automatically operable to lift said table top when the movable shear blade ascends to a predetermined upper level after shearing a workpiece.

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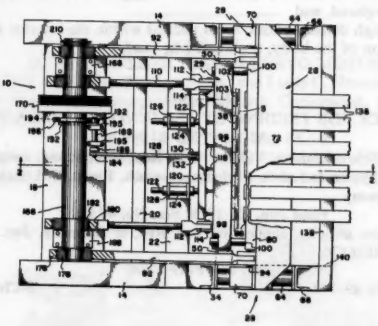
**4,313,358**

## DYNAMICALLY BALANCED TRIM PRESS

**Gaylord W. Brown, Beaverton, Mich., assignor to Sweetheart Plastics, Inc., Wilmington, Md.**

**Filed Sep. 10, 1979, Ser. No. 73,690**
**Int. Cl.³ B26D *7/18***
**U.S. Cl. 83—97** **8 Claims**



1. Trim apparatus for severing articles which have been differentially pressure-formed in a thermoplastic sheet from the thermoplastic sheet comprising:

a frame;

means on said frame for successively indexing a continuous thermoplastic sheet having articles formed therein downstream to a trim station;

a pair of dynamically balanced trim platens, including a pair of trim dies, mounted on said frame for movement between spaced apart positions and closed positions in which said trim dies engage opposite sides of said sheet to sever an article at said trim station from said sheet;

one of said platens including an opening therethrough for receiving the article as it is being trimmed and for passing the article after it is trimmed;

one of said trim dies comprising a female due having a passage therethrough in alignment with said opening for receiving said article as it is being trimmed and for passing said article;

article receiver means, stationarily mounted on said frame and received by said opening for receiving the articles from said female trim die and said one platen;

ejector means, mounted on the other of said platens for movement relative thereto, for moving the article through said die passage to said receiver means after said article is severed from said sheet;

first and second opposing sheet severing means mounted on said frame, downstream of said trim station, for to-and-fro relative movement toward and away from each other between positions in which at least one of said sheet severing means is spaced from a portion of the sheet downstream of the trim station and positions in which said first and second sheet severing means engage opposite sides of said sheet to sever the terminal end portion of said sheet from the remainder of the sheet; and

means for moving said sheet severing means in timed relation with movement of said trim die members to sever the terminal portion of said sheet a predetermined time after said trim die members engage the sheet at the trim station.

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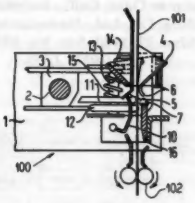
**4,313,359**

## DEVICE FOR CUTTING VERTICAL PAPER SHEETS

**Miroslav Smoravek, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Jun. 3, 1980, Ser. No. 156,100**
**Claims priority, application Fed. Rep. of Germany, Jun. 27, 1979, 2925936**
**Int. Cl.³ B41J *11/70*; B26D *1/20*; B23D *19/02***
**U.S. Cl. 83—157** **9 Claims**



1. A device for cutting vertical paper sheets comprising a planar surface over which paper is conducted having a cutting edge, a carriage means having a cutting wheel journaled on the carriage for running along said cutting edge and a pressure roller for running over said planar surface, a bar engageable by said carriage adjacent said cutting edge and having mounted thereto a chute means for receiving paper past said cutting edge, and means for rotating said bar in response to engagement by said carriage when said cutting wheel is running along said cutting edge such that the chute means and pressure roller serve to hold the paper against the cutting edge during cutting.

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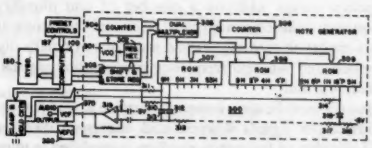
**4,313,360**

## HARMONIC GENERATOR FOR ADDITIVE SYNTHESIS OF MUSICAL TONES

**Alfred H. Faulkner, 1324 Portesuello Ave., Santa Barbara, Calif. 93105**

**Filed Mar. 26, 1980, Ser. No. 134,251**
**Int. Cl.³ G10H *1/08, 5/06***
**U.S. Cl. 84—1.21** **10 Claims**



1. In an electronic organ of the additive-synthesis type, a tone generator for producing a series of harmonics comprising:

a signal generator including a counter and having two binary output bits for each harmonic,
a tone signal utilization circuit,
an adjustable voltage source for each harmonic,
coupling elements connecting each of said voltage sources and the corresponding two outputs of said signal generator to said utilization circuit in an additive relation,
a tone signal source driving the counter of said signal generator,
said signal generator producing output bit patterns such that each pair of bits is a digital representation of the corresponding harmonic, and
said coupling elements being weighted so as to minimize distortion of the tone signals produced in said utilization circuit.

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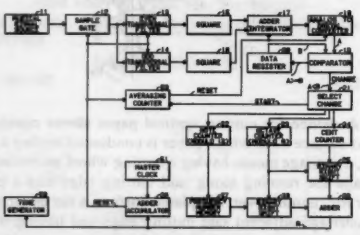
**4,313,361**

## DIGITAL FREQUENCY FOLLOWER FOR ELECTRONIC MUSICAL INSTRUMENTS

**Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instruments Mfg. Co., Ltd., Hamamatsu, Japan**

**Filed Mar. 28, 1980, Ser. No. 135,054**
**Int. Cl.³ G01H 1/00**
**U.S. Cl. 84—1.01** **11 Claims**



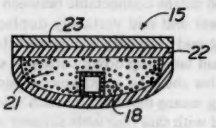
1. An apparatus for determining the fundamental frequency of a periodic signal comprising;
a frequency generating means for generating a sample timing signal in response to an output frequency number,
a sampling means responsive to said sample timing signal for generating a sequence of sample signals having amplitude values corresponding to said periodic signal,
a matched filter means for generating a matched signal in response to said sequence of sample signals,
a convertor means for converting said matched signal to a sequence of binary digital numbers,
a frequency number memory storing a plurality of frequency numbers,
a selection means whereby a member of said plurality of frequency numbers is addressed from said frequency number memory in response to said sequence of binary digital numbers and wherein frequency modification signals are generated, and
a frequency modification means responsive to said frequency modification signals wherein said addressed member of said plurality of frequency numbers is modified in numerical value to create said output frequency number corresponding to the fundamental frequency of said periodic signal.

**4,313,362**

## GUITAR CONSTRUCTION

**Thomas G. Lieber, 9 E. Valley Stream Blvd., Valley Stream, N.Y. 11580**

**Filed Jan. 22, 1980, Ser. No. 114,224**
**Int. Cl.³ G10D 3/00**
**U.S. Cl. 84—267** **3 Claims**




1. An electric guitar comprising
(a) a body having a rear panel and sides integrally formed of plastic and defining a hollow interior, and a top panel attached over the hollow interior,
(b) a neck having a substantially U-shaped cross-section and being formed of plastic, the neck being integrally formed with the body with its open side lying in a plane parallel to that of the top of the body, the neck having a flat plastic panel attached across its open side,
(c) a peg head integrally formed of plastic with the neck, the peg head having a hollow interior,
(d) a fret board attached to the flat plastic panel of the neck,
(e) an aluminum reinforcement rod glued within the body of the rear panel thereof and extending through the interior of the neck and peg head and being glued to the neck and peghead, and
(f) high density plastic foam packed within the interior portion of the body, neck and peg head.

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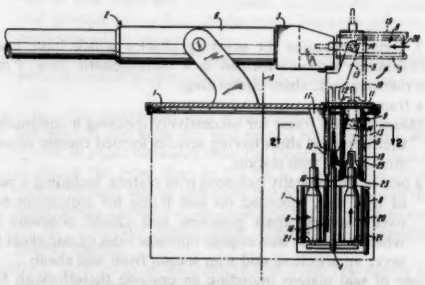
**4,313,363**

## DEVICE FOR FEEDING OF AMMUNITION FOR A TOP MOUNTED GUN

**Klaus Schreckenberg, Vellmar, Fed. Rep. of Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany**

**Filed Jun. 12, 1979, Ser. No. 47,901**
**Claims priority, application Fed. Rep. of Germany, Jun. 15, 1978, 2826136**
**Int. Cl.³ F41F 9/06**
**U.S. Cl. 89—46** **5 Claims**



1. A device for feeding ammunition from a vehicle interior to a weapon, gun or cannon including particularly transporting of cartridges usable with armored vehicles having a gun mounted on top of a rotatable platform thereof, said device in combination as a single unit and structurally integrated comprising:
elevator means operatively connectible at the underside of said platform for receiving a cartridge from a magazine provided below said platform;
cartridge receiving means operatively connectible to said

elevator means for receiving a cartridge therefrom, said receiving means including;

(a) a tubular cartridge receiver, said tubular cartridge receiver being connectible to and movable within said elevator means for retaining a cartridge during transport thereof from said magazine to a point above said platform, said cartridge receiver with said cartridge therein also being movable from said point above said platform to a position coaxial with the bore of said gun belonging therewith;

(b) spring biased means for centering a cartridge in said tubular cartridge receiver, said centering means being adapted to extend into the free cross-sectional area of said cartridge receiver;

(c) at least one spring biased holder means operatively connectible to said tubular cartridge receiver for holding a cartridge belonging therewith in said cartridge receiver, said at least one holder means being adapted to be movable perpendicular to the longitudinal axis of said cartridge receiver;

ram means in said cartridge receiver for moving a cartridge into said bore of said gun, said cartridge recevier serving as a charging tube for said gun; and

means for effecting pivotable movement of said cartridge receiver, said cartridge receiver including diametrically opposed apertures corresponding in shape to the forward portion of a cartridge for allowing a cartridge to be received in said cartridge receiving means.

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**4,313,364**

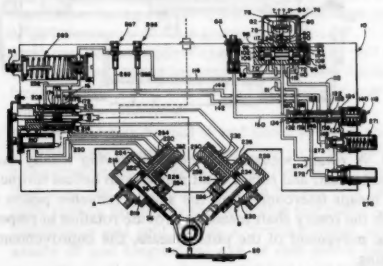
## DUAL CYLINDER LINEAR SERVO MOTOR

**Richard A. Blincoe, Portage, Mich., and Louis C. Hrusch, Chesterland, Ohio, assignors to Pneumo Corporation, Boston, Mass.**

**Filed Jun. 4, 1979, Ser. No. 45,425**

**Int. Cl.³ F01L *33/02*; F01B *15/04*; F15B *13/16***

**U.S. Cl. 91—176** **26 Claims**



1. A servoactuator for controlled rotation of a crankshaft and the like comprising a plurality of angularly disposed actuators, means operatively connecting said actuators to a shaft for effecting rotation of such shaft in response to reciprocating movements of said actuators, and means for sequencing a source of high pressure fluid and return to the respective ends of said actuators so that said actuators continuously develop output force except for end stroke points, said means for sequencing comprising valve means driven by the rotary motion of such shaft, said valve means comprising a rotatable sleeve having arcuate channels at each end respectively communicating with a source of high pressure fluid and return, and static ports adjacent each end of said rotatable sleeve which sequentially communicate with said arcuate channels as said rotatable sleeve rotates thereby sequencing high pressure fluid and return to the respective ends of said actuators.

**4,313,365**

## CONTROL VALVE FOR A SERVO-STEERING MECHANISM

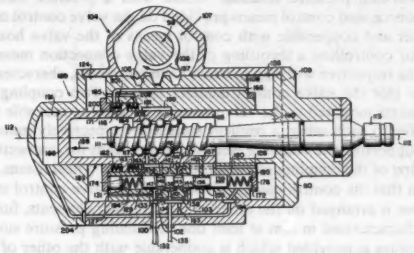
**Joachim Lückel, Paderborn, and Rolf Povel, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany**

**Filed Jul. 16, 1979, Ser. No. 58,760**

**Claims priority, application Fed. Rep. of Germany, Jul. 29, 1978, 2833315**

**Int. Cl.³ F15B *9/08, 13/14***

**U.S. Cl. 91—372** **21 Claims**



1. A control valve arrangement for a servo-steering mechanism which includes a valve housing and a valve control member disposed in the valve housing, the valve control member being responsive to arbitrary steering motions of a steering wheel means and being adapted to execute relative movements with respect to the valve housing, a first working pressure chamber means in the housing for providing a servo-assist during a right-hand turning of the steering wheel means, a second working pressure chamber means in the housing for providing a servo-assist during a left-hand turning of the steering wheel means, the valve housing including a first valve connection means for connecting the valve housing with a pump pressure line, a second valve connection means for connecting the valve housing with a pressure medium return line, a third valve connection means for connecting the first working pressure chamber means with a pressure medium source, and a fourth valve connection means for connecting the second working pressure chamber means with a pressure medium source, and control means provided on the valve control member and cooperable with control means of the valve housing for controlling a throttling of the valve connection means of the respective working pressure chamber means, characterized in that the valve control member includes two coupling elements mounted in the valve housing so as to be movable relative to each other, a resilient means for respectively mutually supporting the coupling elements, gear means for connecting a first of the coupling elements to the steering wheel means, and in that the control means provided on the valve control member is arranged on the other of the coupling elements, wherein the control means provided on the other coupling element includes a first set of four control edges constructed to cooperate with a second set of corresponding control edges provided at the valve housing in such a manner that all four control edges of the first set are constrained to move jointly relative to all of the control edges of the second set, two of the control edges being adapted to control a throttling of two pressure medium connections of the valve connections of one of the working pressure chamber means and the two other control edges being adapted to control two pressure medium connections of the valve connections of the other working pressure chamber means.

18. A control valve arrangement for a servo-steering mechanism which includes a valve housing and a valve control member disposed in the valve housing, the valve control member being responsive to arbitrary steering motions of a steering wheel means and being adapted to execute relative movements with respect to the valve housing, a first working pressure

chamber means in the housing for providing a servo-assist during a right-hand turning of the steering wheel means, a second working pressure chamber means in the housing for providing a servo-assist during a left-hand turning of the steering wheel means, the valve housing including a first valve connection means for connecting the valve housing with a pump pressure line, a second valve connection means for connecting the valve housing with a pressure medium return line, a third valve connection means for connecting the first working pressure chamber means with a pressure medium source, and a fourth valve connection means for connecting the second working pressure chamber means with a pressure medium source, and control means provided on the valve control member and cooperable with control means of the valve housing for controlling a throttling of the valve connection means of the respective working pressure chamber means, characterized in that the valve control member includes two coupling elements mounted in the valve housing so as to be movable relative to each other, a resilient means for respectively mutually supporting the coupling elements, gear means for connecting a first of the coupling elements to the steering wheel means, and in that the control means provided on the valve control member is arranged on the other of the coupling elements, further characterized in that at least one modulating pressure surface means is provided which is cooperable with the other of said coupling elements, means are provided for exposing the at least one modulating pressure surface means to a modulating pressure proportional to a pressure of one of the working pressure chamber means, said modulating pressure surface means being adapted to urge said other coupling element into a position with respect to the valve housing so as to increase the pressure of said one working pressure chamber means upon an occurrence of a pressure surge triggered by an external shock applied to the servo-mechanism.

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**4,313,366**

## ELECTROMAGNETIC VALVE ASSEMBLY

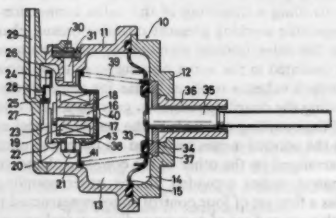
**Masami Inada, and Kongou Aoki, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Filed Dec. 20, 1979, Ser. No. 105,575**

**Claims priority, application Japan, Dec. 25, 1978, 53/177833[U]**

**Int. Cl.³ F15B *13/044***

**U.S. Cl. 91—459** **9 Claims**



1. An electromagnetic valve assembly comprising:

a housing;

a diaphragm member provided in said housing and defining first and second chambers therein;

first heat conductive plate means secured to said diaphragm member;

a heat conductive output member secured to said first heat conductive plate means and extending outside of said housing;

heat conductive spring means one end of which is engaged with said first heat conductive plate means, said spring means being positioned within said first chamber and normally biasing said diaphragm member in one direction;

a solenoid coil having a central core member with a projection extending therefrom, said coil positioned in said first chamber and energized in response to an electric signal;

a movable contact operatively associated with said solenoid coil movable in response to an energization of said solenoid coil,

a first and second pressure source;

first valve means controlling fluid communication between said first chamber and said first pressure source in response to movement of said movable contact;

second valve means controlling fluid communication between said first chamber and said second pressure source in response to movement of said movable contact;

second heat conductive plate means having a central U-shaped cup portion with an outwardly protecting radial flange portion positioned between said solenoid coil and an opposite end of said spring means for transmitting heat generated by said solenoid coil to said spring means such that said spring means contacts said flange portions; and

said second heat conductive plate means forming a hole for receiving said projection of said central core member.

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**4,313,367**

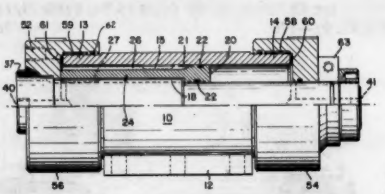
## ROTARY ACTUATOR

**Paul P. Weyer, 48811 284th Southeast, Enumclaw, Wash. 98022**

**Continuation-in-part of Ser. No. 93,680, Nov. 13, 1979. This application May 8, 1980, Ser. No. 147,861**

**Int. Cl.³ F01B *3/00***

**U.S. Cl. 92—33** **12 Claims**



1. A rotary actuator of the type having axially movable piston means and rotary shaft means with helical torque transfer means interconnecting the axially movable piston means with the rotary shaft means to provide rotation in response to axial movement of the piston means, the improvement comprising:

actuator cylinder means;

said shaft means mounted in the cylinder means;

bearing means mounting the cylinder means and shaft means at opposite ends thereof for rotation relative to one another;

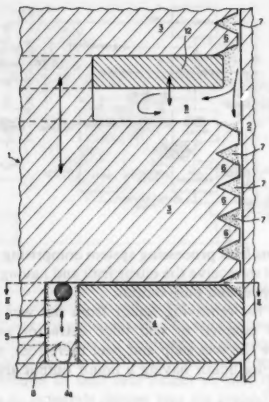
said piston means axially movable within the cylinder means, said piston means including motion conversion means coupled to the cylinder means and shaft means for converting axial motion of the piston means into relative rotary motion between the shaft and cylinder means; and

said bearing means each including a radially outer circumferential flange which extends axially over the cylinder means, radial and thrust bearing members positioned between the cylinder means and the flanges whereby large radial and thrust loads on the shaft means or the cylinder means can be withstood without increasing the length of the cylinder means.

## 4,313,368
## RECIPROCATING PISTON

Maurice Promeyrat, Sevran, France, assignor to Societe Civile Promeyrat-Casteilla, Gagny, France

Filed May 17, 1979, Ser. No. 39,808
Claims priority, application France, Jun. 1, 1978, 78 16444
Int. Cl.[3] F16J *1/02, 1/08*
U.S. Cl. 92—159 6 Claims



1. A reciprocating piston for heat engines, compressors, and other like industrial machines having a co-operating piston and cylinder, comprising:

a piston body having a longitudinal axis and including an upper bead, said piston body being provided in a direction radially transverse to said longitudinal axis with a transverse annular groove having an inner portion and a radial hole extending radially inwardly from said inner portion of said annular groove;

a first ring housed in said transverse annular groove having a rear inner facing surface spaced from said inner portion of said transverse annular groove;

at least one decompression chamber formed in said transverse annular groove between said rear inner facing surface of said first ring and said inner portion of said transverse inner groove; and

a movable split ring housed in said decompression chamber formed in said transverse annular groove, said split ring being continuous between split ends thereof, said split ring having at one of its ends thereof a branch bent substantially radially inwardly engaged within said radial hole for maintaining said split ring in a circumferential direction axially of said longitudinal axis of said piston body for permitting said ring to have radial and axial movement;

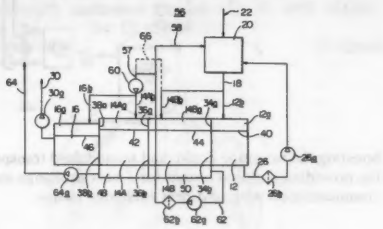
said upper bead having on its periphery projecting ribs and recessed portions spaced from the inner wall of its said cooperating cylinder, said projecting ribs alternating with said recessed portions;

said projecting ribs having a diameter related to the diameter of the inner wall of said cylinder such that the initial diametrical clearance between said outer rib periphery axially of said piston in its cold condition and said inner wall periphery of said cylinder is substantially equal to half the clearance usually provided with a conventional piston and said inner wall of said cylinder such that during running-in said projecting ribs are pressed against the inner wall of said cylinder whereby said projecting ribs may become compressed and contract so that said recessed portions absorb such compressions by lubricating said projecting ribs with driving fluid that they retain.

## 4,313,369
## PAINTING PLANT AND METHOD FOR PAINTING ARTICLES WITH REDUCED RUNNING COST

Mitsuo Tsuruta, Tokyo, and Hachiro Haga, Zushi, both of Japan, assignors to Nissan Motor Company Ltd., Yokohama, Japan

Filed Jul. 5, 1979, Ser. No. 54,903
Claims priority, application Japan, Jul. 12, 1978, 53-84803
Int. Cl.[3] B05C *15/00*
U.S. Cl. 98—115 SB 4 Claims



1. A painting plant for painting articles, comprising:

(a) first and second painting booths connected in series, said articles being conveyed from the first painting booth to the second painting booth for successive painting operations;

(b) a cleaning booth arranged upstream of the first painting booth for cleaning said articles prior to conveyance into the first painting booth;

(c) a setting booth arranged downstream of the second painting booth for setting or curing paint or the like applied to said articles in the first and second painting booths;

(d) air-conditioning means for conditioning temperature and humidity of ambient fresh air entering said means;

(e) conditioned air feed inlet means interconnecting the air-conditioning means to at least one of the setting booth, the cleaning booth, the first painting booth and the second painting booth for feeding conditioned air to said booths; and

(f) air recirculating means for transmitting air from at least one of the booths to the air-conditioning means for reuse, wherein said air recirculating means includes a first conduit system transmitting air from said cleaning booth to said air-conditioning means, a second conduit system for transmitting air from said first painting booth to the air-conditioning means, said first and second conduit systems being mutually independent, wherein each of said conduit systems includes a duct, a blower positioned in the duct for moving the air to said air-conditioning means, and a filter positioned in said duct for filtering the air passing therethrough, and wherein said second conduit system further includes a branch conduit for directing a portion of the returning air in the second conduit system to the second painting booth and the setting booth.

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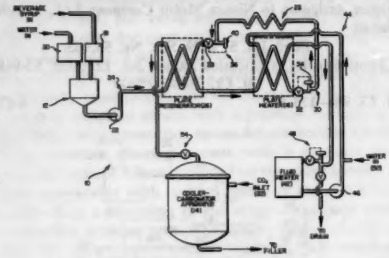
## 4,313,370
## PASTEURIZING SYSTEM FOR CARBONATED SOFT DRINKS

Sigmund P. Skoli, Elmwood Park; William C. Ore, Elmhurst; David M. Kemp, Naperville, and Harry G. Mojonnier, River Forest, all of Ill., assignors to FMC Corporation, Chicago, Ill.

Filed Jun. 2, 1980, Ser. No. 155,301
Int. Cl.[3] A23L *2/00*
U.S. Cl. 99—323.1 6 Claims

1. A pasteurizing system for soft drinks comprising: supply means providing a flow of prepared beverage liquid; means for cooling and carbonating said liquid; heat exchange means disposed flowpathwise between said supply means and said means for cooling and carbonating the beverage liquid; first fluid transport means including a holding tube between said heat exchange means and said means for cooling and carbonat-

ing the beverage liquid for providing a closed, beverage circuit from said supply means to said heat exchange means and from said heat exchange means to said means for cooling and carbonating the beverage liquid; and second fluid transport means for providing a closed circuit for a heat exchange medium, in communication with said heat exchange means.



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**4,313,371**

**PRESSURE COOKER RELIEF VALVE AND PRESSURE COOKERS INCORPORATING SUCH ASSEMBLIES**

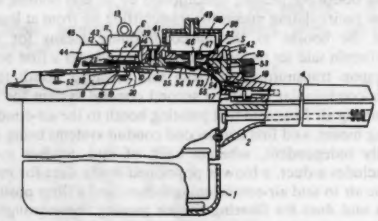
**Frederick P. Jackson, Barrowford, and Brian Newell, Brierfield, both of England, assignors to The Prestige Group Limited, London, England**

**Filed May 11, 1978, Ser. No. 905,026**

**Claims priority, application United Kingdom, May 27, 1977, 22613/77**

**Int. Cl.³ A47J *27/08***

**U.S. Cl. 99—337** **22 Claims**



1. A pressure cooker the casing thereof carrying a pressure relief valve assembly comprising a relief valve having a valve member and a valve seating defining a valve port opening into the interior of the cooker, said valve port having an axis, means for biasing said valve member against said valve seating to close said valve port under the pressure of said biasing means, timer means which can be preset for acting on an operating member after a predetermined time period, said operating member being mounted for relative reciprocal motion in opposite first and second linear directions generally normal to said valve port axis, said timer means having an actuating member which moves to permit movement of said operating member in a first of said linear directions, said operating member being mechanically connected to means for relieving the pressure of the biasing means, and said pressure relieving means being a wedge carried by said operating member movable beneath said biasing means by movement of said operating member in said first direction to lift said biasing means and open said cooker interior to atmosphere through said valve port.

**4,313,372**

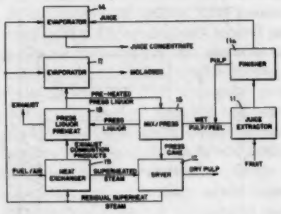
**CITRUS PROCESSING SYSTEM AND METHOD**

**Gordon P. Gerow, Davenport, Fla., and John H. Blake, Portola Valley, Calif., assignors to FMC Corporation, Chicago, Ill.**

**Division of Ser. No. 944,044, Sep. 20, 1978. This application Jan. 14, 1980, Ser. No. 111,569**

**Int. Cl.³ A23N *1/00, 15/00***

**U.S. Cl. 99—483** **5 Claims**



1. A citrus fruit processing system comprising a juice extractor adapted to receive the citrus fruit and having a juice output and a wet peel and pulp output,

a means for removing liquor from the wet pulp and peel output coupled to said juice extractor and adapted to receive the wet pulp and peel therefrom, said means for removing liquor having a liquor output and a press cake output,

a dryer coupled to said press cake output and having a dried solids output and a steam output,

a heat exchanger coupled to said steam output and having a superheated steam output, said heat exchanger having an isolated combustion chamber which operates to transfer heat to steam passing therethrough without contact between said steam and combustion products produced in said chamber,

said superheated steam output being coupled to said dryer whereby wet peel and pulp introduced into said dryer is heated by superheated steam until a major portion of the moisture therein is vaporized and emitted through said steam output,

a juice evaporator coupled to said juice output and to said steam output of said dryer, and having a concentrated juice output, said juice evaporator operating to dehydrate the juice,

means for preheating liquor coupled to said means for removing liquor, said means for preheating being connected to receive the exhaust combustion products from said heat exchanger combustion chamber whereby the liquor is preheated by the combustion products, and,

a second evaporator coupled to said means for preheating liquor and to said steam output of the dryer, said second evaporator operating to dehydrate the liquor.

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**4,313,373**

**APPARATUS FOR PITTING DATES OR THE LIKE**

**Viktor Fehlmann, Möriken, Switzerland, assignor to Ferrum AG, Rupperswil, Switzerland**

**Continuation of Ser. No. 115,879, Jan. 28, 1980, abandoned, which is a continuation of Ser. No. 933,825, Aug. 15, 1978, abandoned. This application Sep. 24, 1980, Ser. No. 190,360**

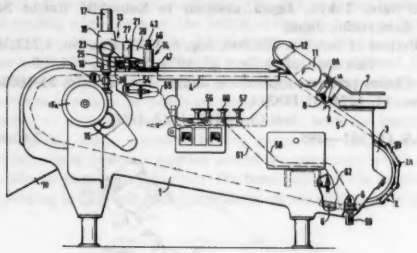
**Claims priority, application Switzerland, Aug. 8, 1977, 10128/77**

**Int. Cl.³ A23N *4/08***

**U.S. Cl. 99—549** **10 Claims**

1. In an apparatus for pitting elongated drupaceous fruits of the type having first and second end portions, especially dates, the combination of a series of supporting elements having elongated sockets for reception of fruits; means for transporting said elements seriatim in a predetermined direction and along a predetermined path to a first station where the fruits

are admitted into at least some of the sockets in successive supporting elements of said series so that one end portion of each admitted fruit extends into the respective socket whereby some of the admitted fruits are normally received in the respective sockets to a lesser first extent and the remaining admitted fruits are received in the respective sockets to a greater second extent, thereupon to a second station and then to a third station; means for orienting at least those fruits which extend into



the respective sockets to said lesser first extent so that the other portion of each such fruit extends substantially counter to said direction, said orienting means being located between said first and second stations; means for centering at said second station those fruits which are received in the respective sockets of the supporting element to said first extent so that the centered fruits are free to penetrate deeper into the respective sockets; and means for removing pits from fruits in the sockets of the supporting element at said third station.

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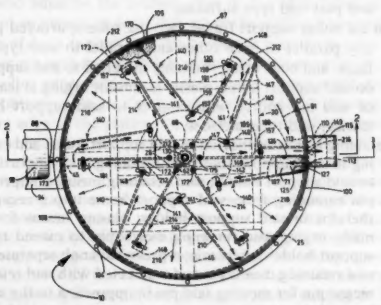
**4,313,374**

## MACHINE FOR HULLING NUTS

**William J. Tjerrild, Acampo, Calif., assignor to Tenneco West, Inc., Bakersfield, Calif.**

**Filed Mar. 5, 1980, Ser. No. 127,498**
**Int. Cl.³ B02B *3/00***
**U.S. Cl. 99—612** **13 Claims**



1. A machine for hulling nuts comprising:

A. a disc having a center, a periphery, and an abrading surface;

B. means mounting the disc for rotation about a substantially erect concentric axis with the abrading surface upwardly disposed;

C. powered means for rotating the disc in a predetermined direction;

D. means for delivering nuts to be hulled to the abrading surface; and

E. a plurality of elongated, nut-directing vanes mounted in adjacent upwardly spaced relation to the abrading surface defining debris passages between the vanes and the surface, said vanes having inner ends adjacent to the center of the disc and outer ends outwardly thereof, successive vanes being oppositely angularly related to respective radii of the disc to define a successive inwardly and outwardly extended reciprocal path of movement of the nuts over the abrading surface.

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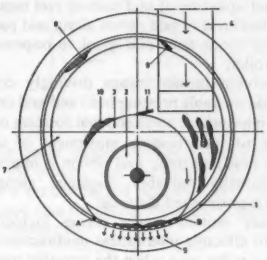
**4,313,375**

## BARK PRESS

**Väinö T. Saalasti, Arinatie 4, 00370 Helsinki 37, Finland**

**Filed May 30, 1979, Ser. No. 43,710**
**Claims priority, application Finland, May 30, 1978, 781706**
**Int. Cl.³ B30B *9/02***
**U.S. Cl. 100—37** **16 Claims**



1. A method for substantially reducing the concentration of entrapped water contained in bark material comprising the steps of feeding said bark material to a bark press provided with a gap formed between an inner face of a rotating relatively large and rigid perforated drum and an outer face of at least one relatively small and compressible resilient presser roll eccentrically mounted within the drum, independently rotating in compressive relationship said at least one presser roll against a portion of said inner face of said perforated drum thereby distorting an arcuate portion of said outer face of said at least one presser roll and applying substantial pressure against a portion of said inner face of said perforated drum abutting said arcuate portion of said at least one presser roll to cause expulsion of entrapped water contained in said bark through the perforations located in that portion of said drum which abuts said at least one pressure roll wherein compressive forces are being exerted upon said bark material; and feeding the bark along the length of the drum so that the bark is compressed several times before exiting.

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**4,313,376**

## IMPRINTER

**Jack G. Swope, St. Ignace, and Harry C. Weiss, Moran, both of Mich., assignors to Rennco Incorporated, Homer, Mich.**

**Filed Mar. 11, 1980, Ser. No. 129,435**
**Int. Cl.³ B41F *1/00, 17/00***
**U.S. Cl. 101—27** **7 Claims**

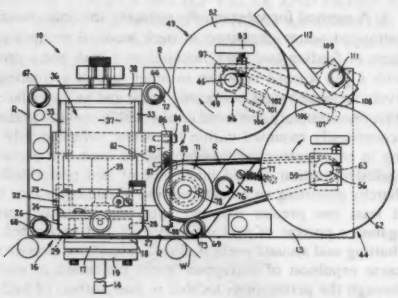
1. In an imprinting apparatus using an imprint ribbon for permitting imprinting of data on a weblike packaging substance, said apparatus including a frame, spool-supporting shaft means rotatably supported on the frame and mounting thereon a spool of said ribbon, take-up reel means rotatably mounted on the frame for winding therearound the used ribbon, guide means disposed for movably guiding the ribbon in a preselected path as the ribbon is withdrawn from the spool and is moved toward said take-up reel means, said guide means maintaining said ribbon straight during a selected part of said path, imprinting means associated with said selected part of the ribbon path for effecting imprinting on said weblike packaging substance, said imprinting means including stationary and movable pressing heads having opposed faces disposed on opposite sides of said ribbon as located in the selected part of

said path, said movable pressing head being slidably guided for linear displacement in a direction substantially perpendicular to said ribbon, said movable pressing head also having type means associated with the face thereof, and motor means connected to said movable pressing head for linearly reciprocating same between extended and retracted positions, said movable pressing head when in said extended position being disposed in pressing engagement with said stationary pressing head so as to press said ribbon and said weblike packaging substance therebetween, said movable pressing head when in said retracted position being spaced from both said stationary pressing head and said ribbon, the improvement comprising:

a rotatable drive roller disposed in direct driving engagement with said ribbon downstream of said imprinting means but upstream of said take-up reel means for effecting displacement of said ribbon along said path, and withdrawal of ribbon from said spool, in response to rotation of said roller;

primary motion-transfer means drivingly connected between said movable pressing head and said drive roller for causing intermittent unidirectional rotation of the latter in response to reciprocating movement of said movable pressing head, whereby said ribbon is intermittently and unidirectionally movably displaced along said path through a preselected distance;

said primary motion-transfer means including one-way means for effecting intermittent unidirectional rotation of said drive roller only when the movable pressing head is



being linearly displaced in one direction, said one-way means enabling the drive roller to remain stationary when the movable pressing head is being linearly displaced in the opposite direction;

said primary motion-transfer means also including a linear gear rack mounted on said movable printing head and disposed in meshing engagement with a rotatable gear, said rotatable gear being drivingly interconnected to said drive roller through said one-way means;

said primary motion-transfer means further including lost-motion means associated therewith for permitting at least limited linear displacement of the movable pressing head in said one direction without causing a corresponding rotation of the drive roller, whereby said lost-motion means results in the rotation of the drive roller occurring over only a fraction of the stroke of the movable pressing head in said one direction;

said lost-motion means comprising connecting means coacting between said gear rack and said movable pressing head for permitting limited relative reciprocal movement therebetween in a direction substantially parallel to the direction of movement of said movable pressing head, biasing means coacting with said gear rack for normally maintaining same in an end position relative to the movable pressing head, and stationary stop means positioned for engagement with said gear rack to movably displace same against the urging of said biasing means when said movable pressing head is positioned at or closely adjacent said extended position; and

secondary motion-transfer means drivingly connected to said take-up reel means for causing intermittent unidirectional rotation thereof.

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**4,313,377**

## INK SUPPLY DEVICE FOR HAND LABELER

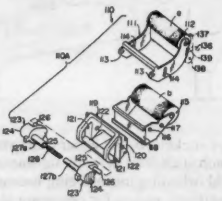
**Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan**

**Division of Ser. No. 830,806, Sep. 6, 1977, Pat. No. 4,213,389. This application Dec. 17, 1979, Ser. No. 104,109**

**Claims priority, application Japan, Jun. 6, 1976, 51-105836; Dec. 11, 1976, 51-148314**

**Int. Cl.³ B41K** *1/42, 5/00*

**U.S. Cl. 101—295** **7 Claims**



1. An ink supply device for a hand labeler:

said labeler comprising: an operating lever, which is movable between two positions; a printing head, including type surfaces adapted to be inked and opposable to a platen; a platen opposable to said type surfaces; moving means for moving said printing head and said platen together and apart;

said ink supply device comprising: a support holder connected with said operating lever for being moved past said type surfaces as said operating lever moves between its said positions;

guide means connected with said support holder for guiding said ink supply device to move along a pathway across and past said type surfaces;

an ink roller support frame; two ink rollers, arrayed generally parallel to each other and parallel to said type surfaces, and both being rotatably attached to and supported on said support frame; elastic means for urging at least one of said ink rollers with respect to said support holder toward said type surfaces;

retaining means connected to said support frame and extending to said support holder for retaining said support frame to said support holder; said retaining means comprising a pin extending from said support frame into a receptacle therefor in said support holder; biasing means for normally urging said retaining means pin to extend to said support holder receptacle; a pressable knob separate from said retaining means pin and connected with said retaining means pin for moving said pin in opposition to the urging by said biasing means upon pressing upon said knob, thereby to separate said retaining means from said support holder.

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**4,313,378**

## NO-LOCK PRINTING PLATE ASSEMBLY USING FLEXIBLE PLATES

**Gordon Etchell, Downers Grove, and Cyril W. Frank, Brookfield, both of Ill., assignors to Pathfinder Graphic Associates, Inc., Berwyn, Ill.**

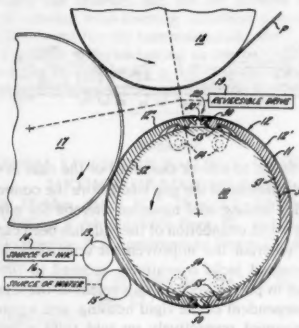
**Continuation-in-part of Ser. No. 115,101, Jan. 24, 1980, abandoned. This application Sep. 19, 1980, Ser. No. 188,935**

**Int. Cl.³ B41F** *27/12*

**U.S. Cl. 101—415.1** **8 Claims**

1. A "no-lock" printing plate assembly comprising, in com-

bination, a drive, a plate cylinder coupled to the drive and having a smooth outer plate-supporting surface interrupted by an axial groove defining leading and trailing edges spaced parallel to one another to form a gap, at least the leading edge having an associated flat, angularly undercut end face making an acute angle with respect to the outer surface, a register pin rigidly anchored with respect to the undercut end face and projecting in the circumferential direction therefrom, a plate formed of a thin sheet of resilient material having a smooth undersurface and bent over adjacent the ends to define leading and trailing edge portions, the width of the gap being at least 5 times but not greater than 50 times the plate thickness, the edge portions of the plate being spaced and dimensioned for insertion successively into the groove into a non-bottoming condition in which the bends are peripherally spaced from one another to provide clearance between them, both the leading and trailing edge portions having respective longitudinal notches alined with one another and of the same axial width as the pin for purposes of register, the bend adjacent the leading edge being in the form of a sharply bent crease making an acute




angle so that when the leading edge portion is hooked over the leading edge in circumferential register it engages the undercut end face with the notch therein in axial register with the pin, the bend adjacent the trailing edge of the plate being in the form of an obtuse angle so that when the trailing edge portion of the plate is tucked into the groove it extends beyond the register pin with the notch therein in axial register with the pin, the trailing edge portion of the plate being bent at a sufficiently wide obtuse angle so that it is outwardly sprung causing the trailing edge of the plate to be in continuous resilient pressing engagement upon the leading edge portion thereby to insure that the latter is maintained in sharply bent condition captive against the undercut end face, and at least a second cylinder in running engagement with the plate so that during the initial revolutions the smooth undersurface of the plate is "ironed" into increasingly intimate engagement with the smooth outer plate-supporting surface accompanied by the taking up of at least a portion of the clearance between the bends and cyclically renewing a vacuum seal under the plates tending to hold the plate in position notwithstanding the effect of centrifugal force tending to dislodge it.

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**4,313,379**

## VOLTAGE-CODED MULTIPLE PAYLOAD CARTRIDGE

**David W. Wallace, Austin, Tex., assignor to Tracor, Inc., Austin, Tex.**

**Continuation of Ser. No. 82,401, Oct. 16, 1979, abandoned. This application Oct. 18, 1979, Ser. No. 83,181**

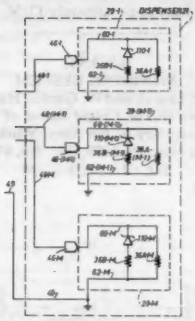
**Int. Cl.³ F42C** *11/00*

**U.S. Cl. 102—217** **28 Claims**

1. A multiple payload cartridge connectible to a source of firing signals by two connecting wires comprising:

a first and a second squib each respectively connected in a parallel electrical branch between the two connecting wires;

a zener diode having a predetermined breakdown voltage connected in series in the branch containing the second




squib, the zener diode preventing the flow of current through the branch with the second squib until a firing signal of a predetermined polarity and a voltage magnitude greater than the predetermined breakdown voltage is applied thereacross.

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**4,313,380**

## DISTRIBUTED CHARGE FOR SEISMIC PROSPECTING

**Samuel T. Martner, and Maurice E. Arnold, Jr., both of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Sep. 15, 1978, Ser. No. 942,568**

**Int. Cl.³ F42D** *1/02, 3/06*

**U.S. Cl. 181—116** **6 Claims**

1. A distributed charge for seismic prospecting, to be used to match a velocity V of seismic waves in a medium comprising:

a plurality of connected lump charges each connected below to a short but effective length of a linear explosive with velocity of detonation $V_p$ which in turn is connected below to a longer piece of a nonexploding linear deflagrator with velocity of propagation $V_n$; where $V_n$ is considerably less than $V_p$, said linear deflagrator terminating below in a blasting cap which is in contact with the adjacent lump charge below;

said linear explosive and said linear deflagrator forming the sole active chemical means between adjacent lump charges;

the length of any one of said lump charges plus one length of said linear explosive plus one length of said linear deflagrator between said adjacent lump charges being designated as D, which length is predetermined such that the time lapse between explosion of two adjacent lump charges is at least approximately D/V.

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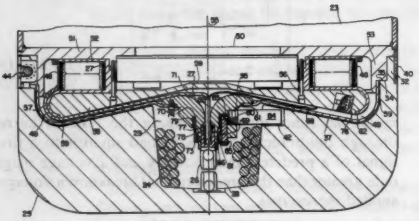
**4,313,381**

## MOORING SYSTEM

**Daniel R. Tolliver, Laurel, and W. Gordon Haug, Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Nov. 26, 1979, Ser. No. 97,269**
**Int. Cl.³ F42B *22/18***
**U.S. Cl. 102—413** **25 Claims**



1. A mooring system for mooring a device in water at a preselected depth below the water surface from an anchor resting on the ocean floor comprising:

a buoyant device;

a weight defining an anchor;

means detachably securing the anchor to the device;

additional means coupling the device and anchor comprising:

a resilient line secured at a first portion thereof to the anchor;

a mooring line secured between a second portion of the resilient line and the device;

a non-rotating storage spool in the device storing the mooring line;

means positioned in the device for initiating payout of the mooring line after the device has passed a first depth; and

means positioned in the device for terminating payout of the mooring line at the preselected depth to which the buoyant device has ascended and which is between the first depth and the water surface;

whereupon after launching of the device and anchor in water, the securing means detaches the anchor from the device permitting the anchor to separate from the device to the extent of the resilient line as the device and anchor descend, said initiating means permits payout of the mooring line from the storage spool after the device descends through the first depth, and said terminating means terminates payout of the mooring line and ascent of the device after the device has ascended to the preselected depth.

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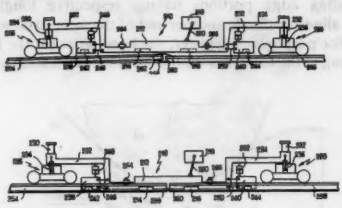
**4,313,382**

## SETTING ARRANGEMENT FOR ALIGNMENT AND GAP BETWEEN TWO RAIL ENDS

**Patrick Bommart, Rueil-Malmaison, France, assignor to C. Delachaux, S.A., Gennevilliers, France**

**Filed Jan. 21, 1980, Ser. No. 113,791**
**Claims priority, application France, Jan. 24, 1979, 79 01798**
**Int. Cl.³ E01B *29/46***
**U.S. Cl. 104—1 R** **7 Claims**

1. An improved apparatus for adjusting the alignment and gap size defined between two rail butt ends of the type in which a rigid housing straddles the two rails and provides an access area around the two rails; a first pair of presses attached in alignment to the housing; a second pair of presses also attached in alignment to the housing and arranged in such a manner with respect to the first pair of presses that the first pair of presses are situated between the second pair of presses to form two units each of which unit is formed by one of the first pair of presses and one of the second pair of presses and each of which units can clamp one of the two rails to be connected respectively; a retractable unit for the adjustment of the size of the gap defined between the two rail ends movably mounted on the rigid housing, the retractable unit movable between a rest position where it is supported on the housing and a working position where it is situated in the access area of the housing, and including a frame mounted thereon, which, when the retractable unit is in the work position, is movable in a direction parallel to that of the rails, removable locking means for



securing the frame to one or the other of the rails in order to achieve an adjustment of the gap size before the connection of the rails, and a fettling tool mounted thereon for eliminating weld beading when connection of the rails has been carried out by welding, wherein the improvement comprises: a pair of vertically mounted jacks operatively secured to the second pair of presses to permit vertical movement of the second pair of presses independent of the rigid housing, and a pair of support stops mounted respectively on said rigid structure between the first press and second press of each unit and vertically adjustable relative to the rigid housing for cooperation with the top of the rails, whereby vertical adjustment of the rails can be effected by the selected vertical movement of the second pair of presses and the adjustable support stops.

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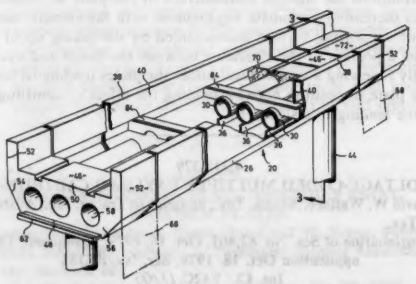
**4,313,383**

## GUIDEWAY UNITS FOR ELEVATED GUIDEWAYS

**Stephen Parazader, 44 Oak Ave., Dundas, Ontario, Canada L9H 4Y9**

**Filed Oct. 23, 1979, Ser. No. 87,612**
**Int. Cl.³ E01B *25/08***
**U.S. Cl. 104—124** **9 Claims**



1. A guideway unit for use in combination with a settable material in the construction of an elevated guideway, the unit comprising:

an elongated closed end watertight metal channel constituted by a bottom metal wall member, spaced side metal wall members, and end metal wall members closing the respective ends of the channel for the retention of settable material therein, the said channel having respective interior walls provided by the said wall members;

at least one elongated metal hollow tubular void-forming member extending the length of the channel in the interior thereof, and connected at its respective ends to the end metal wall members so as to constitute longitudinal reinforcement for the channel, each hollow void-forming member being spaced from the channel interior walls and being connected to a channel interior wall along its length by at least one longitudinal web member fastened to the tubular member external wall and to the respective channel interior wall;

and set settable material filling the metal channel and surrounding each hollow void-forming member and the respective longitudinal web member so as to enclose them;

the metal channel constituting permanent formwork for the settable material and together with the set settable material constituting a composite slab with composite action between the channel and the set settable material, the metal tubular void-forming members providing tension reinforcement for the composite slab; and

the set settable material having an upper surface capable of providing or supporting a roadway for vehicles moving on the guideway.

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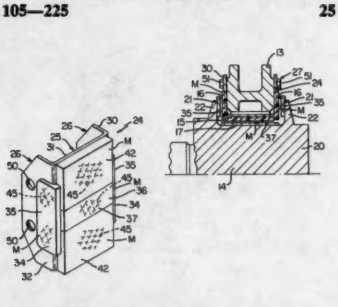
**4,313,384**

## PEDESTAL LINER FOR RAILWAY VEHICLE AND METHOD OF MAKING SAME

**Homer N. Holden, Sylva, N.C.; Donald L. Kleykamp, Dayton, Ohio; William F. Moore, Villa Park, Ill., and Julien C. Mathieu, Waynesville, N.C., assignors to Dayco Corporation, Dayton, Ohio**

**Filed Jul. 10, 1980, Ser. No. 167,292**
**Int. Cl.³ B61F 5/32**
**U.S. Cl. 105—225** **25 Claims**



**1.** In a pedestal liner for a railway vehicle wherein said vehicle comprises; pedestal trucks comprising pairs of pedestal legs; a journal box disposed between each associated pair of pedestal legs; each journal box having a vertically disposed planar guide surface and a pair of spaced vertically disposed parallel side surfaces disposed on opposite sides of said guide surface; said pedestal liner being roughly U-shaped and comprising; a bight and a pair of parallel legs and being adapted to be disposed between an associated pedestal leg and journal box and fastened to the associated pedestal leg; a roughly U-shaped metal support comprising the main structural portion of said liner; said metal support also having a bight and a pair of parallel legs; antifriction polymeric material for said parallel legs of said liner supported by said metal support and adapted to engage said side surfaces; and antifriction polymeric material for said bight of said liner supported by said metal support and adapted to engage said guide surface; said antifriction polymeric material being ultra high molecular weight polymeric material; the improvement in which, said antifriction polymeric material for said parallel legs and at least a portion of said bight of said liner comprises an insert comprised of said antifriction polymeric material and being carried by said metal support, said insert having a pair of roughly parallel members which have outer portions disposed outwardly of and parallel to said parallel legs of said support with said outer portions being adapted to engage said side surfaces, said parallel members comprising said antifriction polymeric material for said parallel legs of said liner, said insert having an arm extending transverse its members with said arm having an outer portion which is adapted to engage said guide surface with said arm comprising at least a portion of said antifriction polymeric material for said bight, and said insert being adapted to be readily installed on and removed from said metal support and held in position by said metal support to define said pedestal liner.

**21.** In a method of making a pedestal liner for a railway vehicle wherein said vehicle comprises; pedestal trucks comprising pairs of pedestal legs; a journal box disposed between each associated pair of pedestal legs; each journal box having a vertically disposed planar guide surface and a pair of spaced vertically disposed parallel side surfaces disposed on opposite sides of said guide surface; said method comprising the steps of; forming a metal support to define a roughly U-shaped configuration therein wherein said support has a bight and a pair of parallel legs extending from opposite side edges of said bight; supporting antifriction polymeric material on said bight of said metal support for engaging said guide surface; supporting antifriction polymeric material on said parallel legs of said metal support for engaging said side surfaces; said antifriction polymeric material being ultra high molecular weight polymeric material; the improvement comprising the steps of, forming an insert which has a pair of roughly parallel members and an arm extending transverse said parallel members, said insert comprising at least a portion of said antifriction polymeric material, providing cutout means in at least one of said bight and parallel legs of said metal support such that said cutout means defines holding surfaces of said metal support, disposing said insert within said cutout means to thereby hold said insert in position employing said holding surfaces, said insert upon being disposed within said cutout means having outer portions of its parallel members disposed outwardly of and parallel to said parallel legs of said support with said outer portions being adapted to engage said side surfaces of said journal box and said arm of said insert having an outer portion which is adapted to engage said guide surface of said journal box.

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**4,313,385**

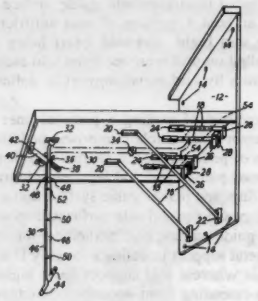
## FOLDING FURNITURE

**Patrick W. Fitzgerald, 13 Third Ave., Filton, Bristol, England**

**Filed Jun. 14, 1979, Ser. No. 48,439**
**Claims priority, application United Kingdom, Jun. 19, 1978, 27321/78**
**Int. Cl.³ A47C 5/04**
**U.S. Cl. 108—38** **4 Claims**

**1.** An improved article of furniture of the kind which includes an elongate leaf, which is normally used in an extended condition in a horizontal plane, pivotally mounted or adapted for pivotal mounting to an upright support at one end of the leaf by a linkage comprising longer and shorter arms pivotally attached at one end to the leaf at respectively outer and inner positions with respect to the upright support, and pivotally attached or adapted for pivotal attachment at their other ends to respectively lower and upper positions on the upright support so that the leaf may be hinged between the extended condition and a collapsed condition in a vertical plane alongside said upright support; wherein the improvement comprises a leg hinged to the other end of the leaf remote from said upright support so that it can be swung between an inoperative position substantially flat against the leaf which allows the leaf to be moved into the collapsed condition and an operative position in which is depends from the leaf for engagement with

the floor so as to support said other end of the leaf and maintain it in the extended condition, the leg having provision for adjustment of its length to match the height at which the leaf is supported at said one end, two pairs of said shorter arms being provided in parallel, the arms of each pair being spaced apart and unconnected with each other, at least the outer arm of each pair lying laterally outwardly of the longer arms, and channel elements on the underside of the leaf arranged to



receive lengthwise the shorter arms when the leaf is in the extended condition, the shorter arms being close fit within the channels so as to be laterally located thereby and provide lateral support for the leaf, said shorter arms being pivotally connected at their ends to channel members so that each shorter arm is received lengthwise in one or more said channels when the leaf is in either the extended or the collapsed condition.

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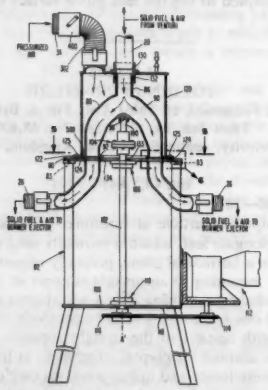
**4,313,386**

**SYSTEM FOR TRANSPORT OF MIXTURES OF SOLID PARTICULATE FUEL AND AIR, AND ROTARY DISTRIBUTOR SUITABLE FOR USE THEREIN**

**Donald M. Boldt, Green Lane, Pa., and Elton McClellan, Harlem, GA, assignors to The Keller Corporation, Hatfield, Pa.**

**Filed Nov. 1, 1979, Ser. No. 90,100**
**Int. Cl.³ F23K *3/02***
**U.S. Cl. 110—104 R** **6 Claims**



1. Distributor apparatus for delivering a stream of particulate solid fuel particles and air from a single stationary source thereof to a plurality of burner-ejector supply conduits in sequence, comprising:

a stationary bottom plate having a plurality of outlet delivery openings extending therethrough, said openings being disposed at different angular positions about a vertical axis through said stationary plate and each being adapted to communicate with the inlet end of a different one of said burner-ejector supply conduits;

a rotatable distributor assembly mounted for rotation above said bottom plate and about said axis;

said rotatable distributor assembly comprising distributor inlet means having an inlet opening through which said axis extends for receiving said stream of solid fuel particles and air from said source, at least two distributor conduit arms each communicating at one of its ends with said distributor inlet means for receiving said stream and dividing it among said arms, and a rotatable upper plate having a plurality of feed openings each extending therethrough and each positioned at the other end of one of said arms so as to receive the portion of said stream traversing its associated arm, said upper plate being positioned to rotate in closely-confronting relation to the upper side of said bottom plate;

said feed openings being spaced from said axis at radii such as to become successively aligned with different ones of said outlet delivery openings in said bottom plate, and to feed the portions of said stream traversing said arms into said different delivery openings as said rotatable distributor assembly is rotated about said axis; a housing enclosing said rotatable distributor assembly to seal it from the ambient atmosphere; pressurized air inlet means for said housing; and means for pressurizing the interior of said housing with air by way of said air inlet means.

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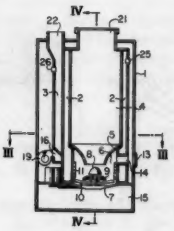
**4,313,387**

**METHOD AND APPARATUS FOR CONTROLLING A SOLID FUEL BURNING FURNACE**

**Kanichi Sato, Asahikawa, Japan, assignor to Hokkai Danro Yugen Kaisha, Asahikawa, Japan**

**Filed Feb. 25, 1980, Ser. No. 124,113**
**Int. Cl.³ F23H *5/20***
**U.S. Cl. 110—192** **10 Claims**



1. A method for controlling a solid fuel burning furnace according to an operational pattern, said furnace having a burning chamber for said fuel and a fuel supply and discharge mechanism composed of a fuel supply means to supply said fuel to said burning chamber and an ash discharge means to remove ash from said burning chamber, said method controlling the burning condition inside said burning chamber by operating said fuel supply and discharge mechanism and including:

said fuel supply and discharge mechanism rejecting an operation signal if received during a time $T_1$ counted from the start of a predetermined operation of said fuel supply and discharge mechanism, said fuel supply and discharge mechanism accepting the operation signal when received after the lapse of said time $T_1$, and said fuel supply and discharge mechanism operating even in the absence of the operation signal after the lapse of the time $T_2$ from said start, wherein

$T_1$ is a time during which the fire force can be maintained after the completion of one operation of said fuel supply and discharge mechanism; and,

$T_2$ is a time during which the burning source can remain with the burning continuing after the completion of one operation of the said fuel supply and discharge mechanism.

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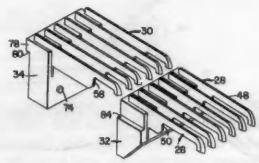
**4,313,388**

## MODULAR HOOK ASSEMBLY FOR STAGGERED NEEDLE CUT PILE TUFTING MACHINES

**Aubrey H. Biggs, Chattanooga; Ian Slattery, Hixson, and Jack G. Workman, Chattanooga, all of Tenn., assignors to Spencer Wright Industries, Inc., Chattanooga, Tenn.**

**Filed Jun. 6, 1980, Ser. No. 156,913**
**Int. Cl.³ D05C *15/00***
**U.S. Cl. 112—79 R** **9 Claims**




1. A modular hook assembly for a staggered needle tufting machine having two transverse rows of spaced needles, the needles in one of the rows being staggered intermediate the needles in the other row, said assembly supporting a first series of hooks having a shank including a mounting portion at one end and a blade extending from the shank to define a throat therebetween and terminating at a bill for cooperation with the needles in one of said rows, and a second series of hooks having a shank including a mounting portion at one end and a blade extending from the shank to define a throat therebetween and terminating at a bill for cooperation with the needles in the other of said rows, said assembly comprising a first body member having means for receiving and securing the mounting portion of said first hooks in spaced side-by-side disposition, a second body member having means for receiving and securing the mounting portions of said second hooks in spaced side-by-side disposition, the spacing between the adjacent first hooks being substantially the same as the spacing between adjacent second hooks, said first and second body members having means defining complementary reference surfaces disposed relatively to the disposition of said first and second hooks for co-operative engagement of said body members and for location of the bills of said first hooks intermediate and spaced in the direction of said blades from the bills of the second hooks by the stagger of said needles, and means for securing said body members together as a unit in said co-operative engagement.

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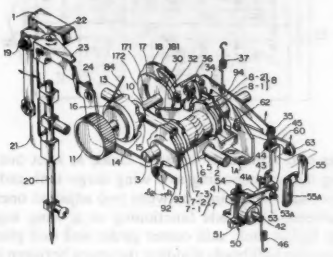
**4,313,389**

## SEWING MACHINE WITH A PATTERN SELECTING DEVICE

**Susumu Hanyu, Hachioji; Shyuzo Morimoto, Hino, and Yasuro Sano, Hachioji, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan**

**Filed Mar. 10, 1980, Ser. No. 129,208**
**Claims priority, application Japan, Mar. 26, 1979, 54-38904**
**Int. Cl.³ D05B *3/02***
**U.S. Cl. 112—158 A** **3 Claims**

1. A sewing machine, comprising a machine housing; a main shaft rotatably mounted in said housing; a needle bar with a needle, said main shaft being operatively connected to said needle bar for vertical reciprocating movement thereof; a fabric feeding device operatively connected to said main shaft; a swingable support mounted in said housing for supporting said needle bar; pattern controlling means rotatable by said main shaft and including needle bar control cams for controlling the swingable movement of said needle bar and fabric feed control cams operatively connected to said fabric feeding device for controlling the movement thereof; first pattern selecting means including a pattern selecting cam and a first follower operatively connected therewith, said first follower being connected to said needle bar and operated by said pattern selecting cam to selectively engage said needle bar control cams, a feed setting cam and a second follower associated therewith, said second follower being operatively connected to said fabric feeding device and adapted to set said device for the feeding movement in response to a position of said second follower with respect to said feed setting cam, a feed selecting cam and a third follower operatively connected therewith, said third follower operated by said feed selecting cam to selectively engage with or disengage from said feed control cams for controlling the movement of said fabric feeding device; said pattern selecting cam, said feed setting cam, and said feed




selecting cam being coaxially mounted on a manually rotated shaft, said feed setting cam displacing said second follower into an operative position during a first complete rotation of said said feed setting cam and displacing said second follower into an inoperative position during the next rotation of said feed setting cam, said feed selecting cam displacing said third follower into an inoperative position in which said third follower is disengaged from said feed control cams during a first complete rotation of said feed selecting cam and displacing said third follower into an operative position in which said third follower engages one of said feed control cams during the next rotation of said feed selecting cam; and second pattern selecting means operatively connected to said third follower, said second pattern selecting means being manually operated to selectively engage or disengage said third follower with one of said feed control cams.

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**4,313,390**

## TANKER CONSTRUCTION

**Shigeto Yunoki, Tokyo, and Masataka Makizono, Sakado, both of Japan, assignors to Yamashita-Shinnihon Steamship Co., Ltd., Tokyo, Japan**

**Filed Feb. 26, 1980, Ser. No. 124,943**
**Claims priority, application Japan, Mar. 14, 1979, 54-029788**
**Int. Cl.³ B63B *39/03***
**U.S. Cl. 114—74 R** **2 Claims**

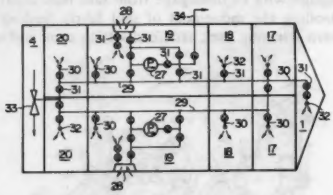
1. A tanker for carrying a liquid cargo in bulk over the water, comprising:

an outer hull shell defined by a hull bottom, a pair of hull sides and a deck, said hull shell containing a bow part with a forepeak tank, a stern part with a machinery room, and a midship tank part between said bow part and said stern part;

an inner bottom in said midship tank part spaced from said hull bottom and extending horizontally across the full breadth of the tanker;

bulkhead means for dividing the space within said midship tank part to form a plurality of cargo tanks and one or more segregated deep ballast tanks above said inner bottom, and also to form a plurality of segregated double

bottom ballast tanks under said inner bottom, said bulkhead means comprising two rows of parallel longitudinal bulkheads extending the full length of said midship tank part from said stern part to said bow part and dividing the region of said midship tank part above said inner bottom into a central tank area flanked by two wing tank areas, a center girder located between said hull bottom and said inner bottom and extending longitudinally from said stern part to said bow part, and a plurality of transverse bulkheads extending transversely across the full breadth of the ship for dividing said center tank area into plurality of central cargo tanks and for dividing each of said wing tank



areas into a plurality of wing tanks, at least one of said wing tanks functioning as a wing cargo tank and at least one of said wing tanks between two adjacent ones of said transverse bulkheads functioning as a wing segregated deep ballast tank, said center girder and said plurality of transverse bulkheads dividing the space between said hull bottom and said inner bottom into a plurality of segregated double bottom ballast tanks;

cargo pumping means for loading or unloading said liquid cargo into or from said cargo tanks; and

ballast pumping means for ballasting or deballasting said deep ballast tanks and said double bottom ballast tanks.

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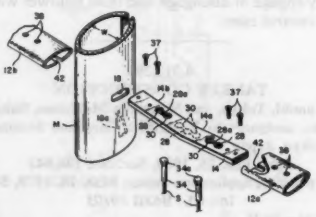
**4,313,391**

**MAST SHROUD SYSTEM**

**Eric R. D. Hall, Marion, Mass., assignor to Schaefer Marine, Inc., New Bedford, Mass.**

**Filed Jan. 25, 1980, Ser. No. 115,217**
**Int. Cl.³ F16B *1/00***
**U.S. Cl. 114—90** **10 Claims**



1. A mast shroud system comprising

A. an elongate rigid bracket for interlocking reception in aligned openings in a boat mast so that the bracket ends extend an appreciable distance out from opposite sides of the mast and the bracket is fixed against rotation about its longitudinal axis,

B. means defining a pair of terminal-receiving pockets in said bracket, said pockets being spaced apart on opposite sides of the transverse center line of the bracket, each pocket having an opening which extends entirely through the bracket so that a terminal secured to the end of a line can seat in the pocket with the line extending out of the pocket through said opening,

C. a pair of tubular spreaders for telescopically engaging over the opposite ends of the bracket, and

D. means for removably securing the telescoped spreaders to the bracket.

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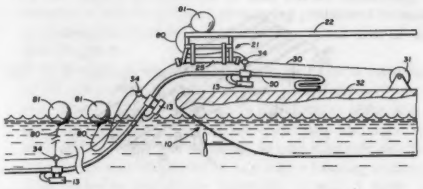
**4,313,392**

**SYSTEM FOR DEPLOYING AND RETRIEVING SEISMIC SOURCE ASSEMBLY FROM MARINE VESSEL**

**Robert O. Guenther, Irving, and Donald F. Huffhines, Richardson, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.**

**Filed Aug. 20, 1979, Ser. No. 68,312**
**Int. Cl.³ B63B *21/66***
**U.S. Cl. 114—244** **5 Claims**



1. A system for deploying and retrieving a seismic source assembly from a marine vessel having at least an upper deck and a lower deck, said system comprising:

a guide structure affixed to the underside of said upper deck;

a strain absorbing element comprising a chain passing through said guide structure and adapted to be deployed and retrieved from said lower deck;

at least one connector means affixed to and positioned at a desired position on said strain absorbing element having two sections, each section having an internal groove conforming essentially to a portion of a link of said chain whereby when said sections are positioned together in an operable position on said chain, said grooves will receive a link of said chain;

means to secure said sections together;

means for attaching a seismic source to said at least one connector means; and wherein said guide structure comprises

a track means through which said strain absorbing element and said at least one connector means affixed thereto passes, means to mount said track means to said underside of said upper deck, and wherein said track means has a continuous open slot throughout its lower length adapted to receive said seismic source attaching means as said at least one connector means passes through said track means whereby said strain absorbing element and said at least one connector means can pass through said track means with said seismic source attached to said at least one connector means.

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**4,313,393**

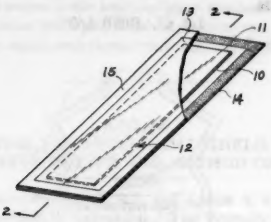
**INDICATOR DEVICE FOR DETECTING THE AMOUNT OF SEBUM IN HAIR AND SCALP AND METHOD THEREFOR**

**Frank D. Barbuscio, Wayne; LeRoy Hunter, Randolph; Joseph C. Hourihan, Little Falls; Mary C. Inglis, Nutley; Helen E. Oberstar, Montville, and Hosny Saad, Ramsey, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.**

**Continuation of Ser. No. 746,452, Dec. 1, 1976, abandoned. This application Sep. 19, 1978, Ser. No. 943,909**
**Int. Cl.³ G01N *21/01***
**U.S. Cl. 116—200** **1 Claim**

1. An indicator device for contact with human hair or scalp for determining the oiliness thereof, comprising (a) an oil-absorbent sheet material capable of absorbing sebum from the hair and scalp, said oil-absorbing sheet material being dyed on

a surface with (b) an oil-soluble dye, soluble in sebum, capable of giving a visual physical color change in the area when placed in contact with sebum to form a spot of differing color when the dye dissolves the sebum of a size proportional to the amount of sebum absorbed by the oil-absorbing material, and (c) a non-adhering oil-permeable transparent sheet material




permeable to said sebum adjacent to and superimposed over said dyed surface, said oil-permeable sheet forming part of an envelope enclosing said dyed oil-absorbent sheet, and allowing passage of sebum when brought into contact with sebum, whereby said sebum is absorbed by said absorbent sheet material to effect said visual physical color change which is visible through said transparent envelope surface.

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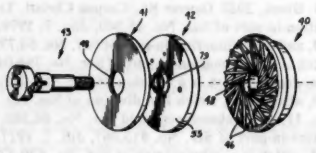
**4,313,394**

## PRINTING APPARATUS

**Steven F. North, Norcross, and Robert B. Sprow, Dunwoody, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.**

**Filed Mar. 20, 1980, Ser. No. 132,042**
**Int. Cl.³ B05C 5/00**
**U.S. Cl. 118—323** **6 Claims**



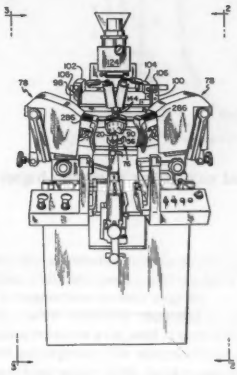

1. Apparatus for printing encoded markings on elongated material comprising a first disc having a plurality of raised lands extending between central and peripheral disc regions; a second disc mounted to said first disc flush against said raised lands with at least one side wall of each of said lands being canted at an oblique angle with respect to said second disc; means for rotating said first and second discs together about an axis extending through said first disc central region; and means for channeling a liquid marking medium to said first disc central region, whereby upon rotation of the discs liquid marking medium channeled to the first disc central region may be propelled outwardly therefrom by centrifugal force along rotary leading canted side walls of said raised lands and into channels of wedge-shaped cross-sectional configuration bounded by the juncture of the canted, rotary leading side walls of the first disc raised lands and the second disc and onto elongated material moved past the apparatus as small well-defined streams.

**4,313,395**

## MECHANISM FOR PERFORMING WORK ALONG AN UPWARDLY FACING PORTION OF A WORKPIECE

**Sinville Runions, Booneville, Miss., assignor to International Shoe Machine Corporation, Nashua, N.H.**

**Division of Ser. No. 27,561, Apr. 6, 1979. This application Apr. 7, 1980, Ser. No. 137,875**
**Int. Cl.³ B05C 5/02**
**U.S. Cl. 118—411** **2 Claims**




1. A mechanism for performing work along an upwardly facing portion of a workpiece having a segment that is inclined upwardly and forwardly and a remainder that is not so inclined comprising: a tool, located above the workpiece portion, mounted for forward movement and for heightwise movement; forward moving means for causing the tool to move forwardly in a tool stroke from a rearward tool position wherein the tool is at the rearward end of said workpiece portion to a forward tool position wherein the tool is at the forward end of said workpiece portion; force applying means for imparting a prescribed yieldable downward force to the tool during the tool stroke to cause the tool to be yieldably urged against the workpiece portion under the prescribed force; relief means for relieving said prescribed force to thereby diminish from the prescribed force the force applied by the tool against the workpiece portion; a control member actuable to actuate the relief means; and an actuating member so constructed and arranged as to actuate the control member during that portion of the tool stroke wherein the tool is moving along and against said workpiece portion segment.

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**4,313,396**

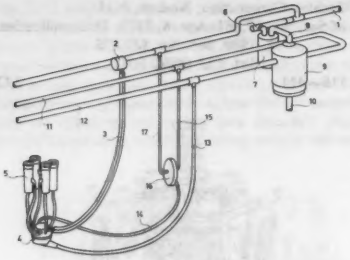
## MILKING PLANT

**Hans K. Olofsson, Huddinge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden**

**Filed May 21, 1980, Ser. No. 151,802**
**Claims priority, application Sweden, May 25, 1979, 7904586**
**Int. Cl.³ A01J 5/04**
**U.S. Cl. 119—14.44** **4 Claims**

1. In a milking system, the combination of a cluster of teat cups, a first pipe line, means operatively connecting said first pipe line to the cluster for pulsating the teats, a second pipe line, means operatively connecting said second pipe line to the cluster to receive milk therefrom, a vacuum source connected to said first pipe line for producing a low vacuum therein, an

ejector leading from said first pipe line, and means through which the ejector communicates with the second pipe line to



maintain in said second line a vacuum higher than said low vacuum.

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**4,313,397**

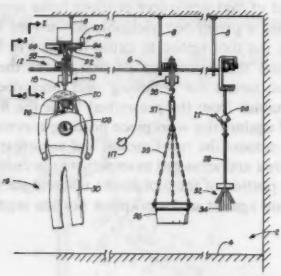
## APPARATUS FOR MOTIVATING ANIMALS TO MOVE

**Donnie D. Markum, 810 Adobe, Amarillo, Tex. 79111**

**Filed Jan. 22, 1980, Ser. No. 114,265**

**Int. Cl.³ A01K *15/00, 29/00*; B61B *3/00***

**U.S. Cl. 119—29** **22 Claims**



3. An apparatus for motivating an animal to move within an enclosed area, comprising:

a track disposed within the enclosed area;

a carriage movably mounted on said track;

drive means for moving said carriage along said track;

actuating means for actuating said drive means, said actuating means including:

a docking member mounted on said track, said docking member having a movable switch-engaging element movable from a first position to a second position;

switch means connected to said carriage for coacting with said movable switch-engaging element when said carriage is positioned adjacent said docking member; and

animal-walking means, connected to said carriage, for causing the animal to move when said actuating means actuates said drive means to move said carriage along said track.

**4,313,398**

## STEAM GENERATOR

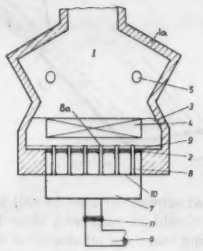
**Hermann Ostendorf, Krefeld, Fed. Rep. of Germany, assignor to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany**

**Filed Oct. 22, 1979, Ser. No. 87,006**

**Claims priority, application Fed. Rep. of Germany, Nov. 22, 1978, 2850536**

**Int. Cl.³ B09B *3/00***

**U.S. Cl. 122—4 D** **9 Claims**



1. In a steam generator, a combination comprising means defining a combustion chamber having a bottom wall; a plurality of steam-generating tubes extending through said chamber at a level above said bottom wall; means for admitting particulate combustible marterial into said chamber; a plurality of air-admitting nozzles extending through said bottom wall and having outlets located above the same so that air admitted through said nozzles causes the particulate combustible material to form a fluidized-bed in said chamber; and adjusting means for adjusting the spacing between said outlets and said tubes, so as to vary the level at which said fluidized-bed is located; said tubes being located in said fluidized bed or in an inert bed layer below said fluidized bed dependent on operating capacity.

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**4,313,399**

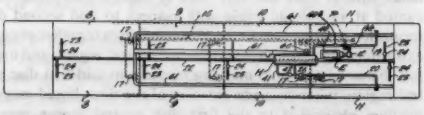
## TECHNIQUE FOR HANDLING VISCOUS LIQUIDS IN TRANSIT OR STORAGE

**Robert B. Black, 2925 Denver St., Corpus Christi, Tex. 78404**

**Continuation-in-part of Ser. No. 46,240, Jun. 7, 1979, Pat. No. 4,271,789, and a continuation-in-part of Ser. No. 58,779, Jul. 19, 1979, which is a continuation-in-part of Ser. No. 794,044, May 5, 1977, abandoned, which is a division of Ser. No. 568,699, Apr. 16, 1975, abandoned, which is a division of Ser. No. 369,084, Jun. 11, 1973, abandoned, said Ser. No. 46,240, is a continuation-in-part of Ser. No. 813,667, Jul. 7, 1977, Pat. No. 4,197,831, which is a continuation of Ser. No. 620,327, Oct. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 462,094, Apr. 18, 1974, Pat. No. 4,025,291, which is a division of Ser. No. 192,262, Oct. 26, 1971, Pat. No. 3,844,270. This application May 29, 1980, Ser. No. 154,423**

**Int. Cl.³ F22B *1/00***

**U.S. Cl. 122—4 R** **39 Claims**



1. Equipment for handling a liquid cargo on a vessel having one or more cargo tanks or compartments, comprising a hydrocarbon burning prime mover of the type in which the exhaust gas contains a substantial amount of free oxygen, heat exchange mechanism including first passage means for the cargo liquid carried in said tanks and other passage means

having indirect heat exchange relation to the cargo liquid in said first passage means, a secondary combustion chamber associated with said other passage means, a conduit for delivering the exhaust gas from said prime mover into the secondary combustion chamber, means for introducing fuel into the secondary combustion chamber, a cargo liquid pump driven by said prime mover, and connections between the pump and said first passage means in the heat exchange mechanism providing for circulation of the liquid from the tanks to and through said first passage means and thence back into the tanks.

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**4,313,400**

## LINED METAL TANK WITH HEAT SHIELD, INDIRECT FIRED WATER HEATER AND METHOD OF MAKING SAME

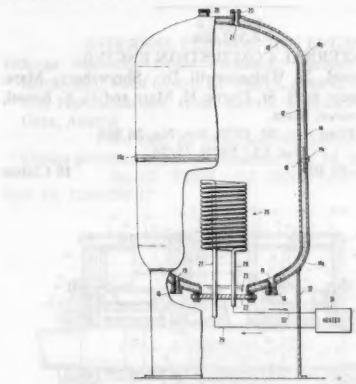
**Robert Walker, Pawtucket, R.I., and Joseph A. Lane, Tauton, Mass., assignors to Amtrol Inc., West Warwick, R.I.**

**Continuation-in-part of Ser. No. 46,763, Jun. 8, 1979, Pat. No. 4,241,843. This application Apr. 22, 1980, Ser. No. 142,722**

**The portion of the term of this patent subsequent to Dec. 30, 1997, has been disclaimed.**

**Int. Cl.³ F22B *1/02***

**U.S. Cl. 122—31 R** **11 Claims**



1. An indirect fired water heater comprising:

(a) a multi-section metallic outer tank wherein the sections are welded together;

(b) a liner of foam insulating material disposed on the interior of said multi-section outer tank, said foam insulating liner having a smooth interior without any inwardly deformed regions;

(c) heat shield means disposed between said outer tank and said foam insulating liner adjacent the welded junctions of said outer tank to prevent damage to or destruction of said foam insulating liner caused by heat generated during the welding operation;

(d) said foam insulating liner having retaining means for securement of said heat shield means adjacent each welded junction, said retaining means not inwardly deforming said foam insulating liner in the region of each welded junction and securing said heat shield means in position even when said outer tank is not in place;

(e) an inner tank of nonmetallic material disposed inside of said foam insulating liner;

(f) means to place water to be heated within said inner tank and to withdraw same therefrom; and

(g) heat exchange means located within said inner tank to transfer heat from a fluid passing therethrough to said water within said inner tank.

**4,313,401**

## REGULATOR FOR AN INTERNAL COMBUSTION ENGINE

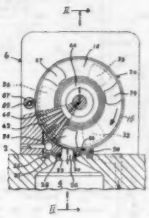
**Walter Monn, Via Monte Tabor 8, 6512 Giubiasco, Switzerland**

**Filed Jan. 30, 1979, Ser. No. 7,930**

**Claims priority, application Fed. Rep. of Germany, Feb. 2, 1978, 2804432; Switzerland, Dec. 1, 1978, 12292/78**

**Int. Cl.³ F01P *1/08***

**U.S. Cl. 123—414** **20 Claims**



1. A regulator for an internal combustion engine having at least one working cylinder space, said regulator comprising:

a housing for connection to said engine;

a rotary slide valve rotatably mounted in said housing to rotate about a rotation axis, said rotary slide valve having at least one passageway for alternatively connecting the cylinder working space with intake and discharge channels in said housing as said valve is rotated in said housing; and

cooling means for cooling said rotary valve, said cooling means including:

a coolant fluid inlet into which coolant fluid is introduced in said valve at a first radial position with respect to said rotation axis;

a first cooling channel portion extending from said inlet to a second radial position located further from said rotation axis than said first radial position; and

a second cooling channel portion extending from said second radial position to a third radial position located radially inward of said second radial position so that coolant is first conducted from an interior part of said valve outwardly to an exterior part of said valve, and is then conducted inwardly to an interior part of said valve.

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**4,313,402**

## INTERNAL COMBUSTION ENGINE RADIATOR COOLING FAN DRIVE MOTOR CONTROL SYSTEM

**Richard N. Lehnhoff, Kettering, and William C. Staker, Springfield, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed Nov. 30, 1979, Ser. No. 98,800**

**Int. Cl.³ F01P *7/02***

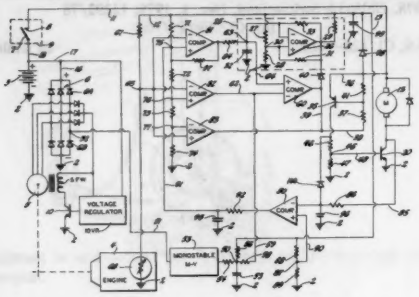
**U.S. Cl. 123—41.12** **5 Claims**

1. An internal combustion engine radiator cooling fan drive motor control circuit adaptable for use with a direct current generating system including a dynamoelectric generator driven by the engine for effecting drive motor energization in such a manner that the average supplied drive motor power is directly proportional to engine speed while the engine temperature is within a range between a predetermined first value and a predetermined higher second value and the engine is operating within a selected speed range, comprising:

means for effecting the periodic energization and deenergization of said drive motor at a predetermined frequency and in such a manner that the ratio of the period of energization to the period of deenergization provides a predetermined drive motor energization duty cycle;

means for producing a signal of a magnitude directly proportional to engine speed; and

means responsive to said signal while the engine temperature is within the range between said predetermined first and second values for extending said drive motor energization duty cycle by an amount directly proportional to engine speed within a selected engine speed range whereby the



average supplied drive motor power is directly proportional to engine speed while the engine temperature is within the range between the predetermined first and second values and said engine is operating within said selected speed range.

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**4,313,403**

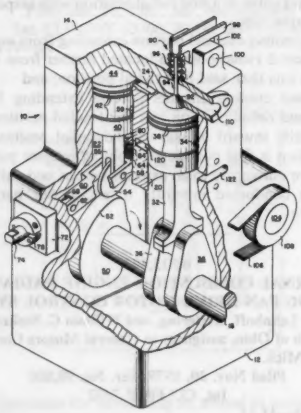
**INTERNAL COMBUSTION ENGINE**

**Norman Bie, Jr., 304 W. Bay Dr., Largo, Fla. 33540**

**Filed Sep. 7, 1979, Ser. No. 73,390**

**Int. Cl.³ F02B *25/12***

**U.S. Cl. 123—53 B** **30 Claims**



1. In an internal combustion engine having intake means for admitting fuel and air into the engine and exhaust means for exhausting products of combustion therefrom:

an engine block having a combustion chamber adapted to receive a charge of fuel and air;

a working piston is sealing engagement with said combustion chamber for converting the energy of combustion into useful work, said working piston reciprocating between a top dead center position whereby the volume of the combustion chamber is diminished, and a bottom dead center position whereby the volume of the combustion chamber is enlarged;

compression means in communication with said combustion chamber for compressing the charge only when said working piston is close to its top dead center position, said compression means comprising an auxiliary piston is sealing engagement with said combustion chamber, said auxiliary piston reciprocating between a top dead center position whereby the volume of said combustion chamber is diminished and a bottom dead center position whereby the volume of said combustion chamber is enlarged, the net volume of said combustion chamber depending on the relative positions of said pistons;

timing means operatively interconnecting said working piston and said compression means to synchronize their operations, said timing means comprising a rotatably driven cam having a contoured cam surface, a cam follower comprising a roller urged against said cam surface, and a connecting rod connecting said auxiliary piston and said cam follower, said connecting rod having a bifurcated lower end and said roller being journalled therein; and

positioning means for adjustably positioning said cam follower with respect to said cam surface, whereby the relative timing of the instant each piston reaches its top dead center position may be changed to vary the compression ratio of the engine, said positioning means comprising a positioning arm connected between said cam follower and an adjustable pivot, said positioning arm comprising a slotted yoke embracing said roller and said bifurcated end of said connecting rod and joined thereto by means of a pivot pin.

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**4,313,404**

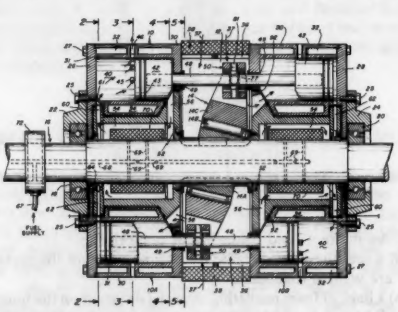
**INTERNAL COMBUSTION ENGINE**

**Horst K. Kossel, 22 Whippoorwill Dr., Shrewsbury, Mass. 01545, assignor to H. St. Pierre; H. Marc and H. K. Kossel, all of Worcester, Mass.**

**Filed Apr. 30, 1979, Ser. No. 34,866**

**Int. Cl.³ F02B *75/26***

**U.S. Cl. 123—58 BB** **18 Claims**



1. An internal combustion engine comprising;

an engine block having means defining a plurality of cylinders arranged in a circular locus and means defining a power transfer compartment adjacent the cylinder,

output shaft means,

means supporting the output shaft means in a rotatble position in the engine block,

a plurality of pistons received each in a cylinder and each having connecting means extending therefrom and into the power transfer compartment,

said engine block having means defining at leat one exhaust port and intake port for the cylinder,

rotor means secured to the output shaft means rotatable therewith and having at least one intake passage for coupling an air-gas mixture to one end of the cylinder over the piston via the intake port,

and an eccentrically-operated power transfer means disposed in the power transfer compartment for converting linear piston action into rotary output shaft means action including an inner member fixed with the output shaft means and an outer member coupled to the connecting

means permitting undulation of the power transfer means with the outer member non-rotatng relative to the output shaft means,

said rotor means also including an air intake passage at one side of the rotor means to permit air flow into the cylinder under the piston at an opposite end of the cylinder, a transfer passage at the opposite side of the rotor means coupling from the opposite end of the cylinder to the intake passage, and means coupling fuel to the transfer passage wherein the fuel and air mix for coupling under pressure to the intake passage,

said means coupling fuel including fuel coupling lines within the output shaft means and a porous member through which the fuel particles pass to the transfer passage wherein the air under pressure passes over the porous member to the intake passage.

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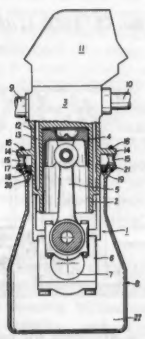
**4,313,405**

## INTERNAL COMBUSTION ENGINE

**Othmar Skatsche; Heinz Fachbach; Gerhard Thien; Karl Kirchweger; Josef Greier, all of Graz, Austria, and Hans List, 126, Heinrichstrasse, Graz, Austria, assignors to Hans List, Graz, Austria**

**Filed Dec. 13, 1979, Ser. No. 103,291**
**Claims priority, application Austria, Dec. 18, 1978, 9052/78**
**Int. Cl.³ F16M *1/02*; F02B *77/00***
**U.S. Cl. 123—195 C** **2 Claims**



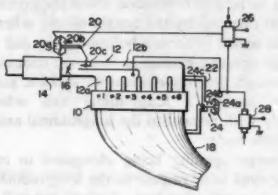
1. An internal combustion engine comprising a crankshaft and crankshaft main bearings, a metallic engine unit support which supports said crankshaft main bearings, and a cylinder-head mounted on said engine unit support, which are engine parts directly affected by body resonance and sound vibration, a metallic crankcase supporting said engine support, at least one vibration absorbing and power transmitting element located between said engine parts which are directly affected by sound vibration and said crankcase, a sealing element located in a joint between said engine unit support and said crankcase, said element sealing an encapsulated upper dry engine region oil-tightly against a lower oil-wetted engine region, and an elastic filling element bridging at least a part of said joint, said filling element underlying said sealing element and supporting the latter, and said sealing element consisting of a viscous material forming an adhesive compound with metal and which is resilient after curing.

**4,313,406**

## MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

**Haruhiko Iizuka, Yokosuka, and Fukashi Sugasawa, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Nov. 16, 1979, Ser. No. 94,887**
**Claims priority, application Japan, Nov. 17, 1978, 53-141175**
**Int. Cl.³ F02D *17/02***
**U.S. Cl. 123—198 F** **5 Claims**



1. An internal combustion engine comprising:

(a) a plurality of cylinders split into first and second groups;

(b) an intake passage provided therein with a throttle valve, said intake passage divided downstream of said throttle valve into first and second branches leading to said first and second cylinder groups, respectively;

(c) a stop valve provided at or near an entrance of said intake passage second branch;

(d) an exhaust passage for said first and second cylinder groups;

(e) an EGR passage communicating between said exhaust passage and said intake passage second branch;

(f) an EGR valve provided in said EGR passage; and

(g) control means, responsive to engine load conditions, for disabling said second cylinder group, closing said stop valve, and opening said EGR valve during the occurrence of high engine load conditions, said control means effective for closing said EGR valve and opening said stop valve with a delay relative to the closing of said EGR valve when the engine load changes from the low load conditions to a high load condition.

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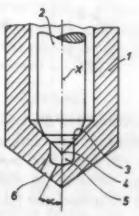
**4,313,407**

## INJECTION NOZZLE FOR AIR-COMPRESSING DIRECT INJECTION INTERNAL COMBUSTION ENGINES

**Eckart Müller, Nürnberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nürnberg, Fed. Rep. of Germany**

**Continuation of Ser. No. 864,604, Dec. 27, 1977, abandoned. This application Jan. 8, 1980, Ser. No. 110,495**
**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658783**
**Int. Cl.³ F02B *3/00***
**U.S. Cl. 123—276** **2 Claims**



1. A fuel injection nozzle for use with an internal combustion engine wherein the engine includes a reciprocating piston having a cavity which forms a combustion chamber in the top surface of the piston which cavity has a wall in the shape of a

surface of revolution wherein means are provided for causing air to swirl in the cavity as the piston reciprocates, the nozzle comprising:

a hollow nozzle body with a nozzle needle positioned therein along the longitudinal axis of the body, said hollow nozzle body including a convex exterior surface at one end thereof, which exterior surface is a surface of revolution about the longitudinal nozzle axis; said nozzle body further including a concave, interior surface which is also a surface of revolution about the nozzle axis and is closed at one end by the nozzle needle when the nozzle needle is sealed to form a hollow space, and

a discharge opening extending from the concave inner surface through the convex exterior surface, said discharge opening having a longitudinal axis which extends obliquely with respect to the longitudinal axis of the hollow nozzle body;

said discharge opening being elongated in cross section taken normal with respect to the longitudinal axis of the discharge opening wherein the transverse length of the opening is greater than the transverse width wherein fuel ejected through the opening forms a stream having a leading edge which conforms to the surface of the combustion chamber wall;

whereby

fuel pushed through the discharge opening by the nozzle needle at high engine leads emerges in a wide flat spray which impinges upon the wall of the combustion chamber along a line which spreads over the wall of the combustion chamber as a film due to swirl of air in the combustion chamber, and whereby

fuel pushed through the discharge opening by the nozzle needle at low engine loads substantially mixes in the swirl of air before impinging on the wall of the combustion chamber.

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**4,313,408**

## DEVICE FOR THE CONTROL OF THE TRAVELING SPEED OF A MOTOR VEHICLE

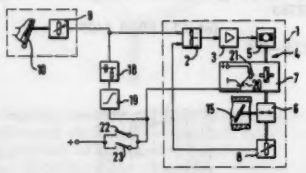
**Harald Collonia, Königstein, Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt, Fed. Rep. of Germany**

**Division of Ser. No. 894,371, Apr. 7, 1978. This application Oct. 22, 1979, Ser. No. 86,828**

**Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2714113; Dec. 2, 1977, 2753702; Dec. 2, 1977, 2753703; Dec. 9, 1977, 2754826**

**Int. Cl.³ F02D *11/10***

**U.S. Cl. 123—340** **6 Claims**



1. A device for the control of the traveling speed of a motor vehicle with a regulating unit actuateable by the vehicle driver, particularly a gas pedal, and means for transmission of the movement of the same to an element, particularly the throttle valve, which influences the fuel-air mixture, comprising

a regulating unit,

a first electrical position encoder being coupled with said regulating unit, said first position encoder having an output with an output signal,

means for influencing the air-fuel mixture of the vehicle,

an electrical adjusting device including a positioning actuator, the latter being connected with said means,

a second electrical position encoder being coupled with said positioning actuator, said second electrical position encoder having an output with an output signal,

an electrical controller including said electrical adjusting device and having a desired value input connected with the output of said first electrical position encoder and applied with the output signal of said first electrical position encoder and having an actual value input connected with the output of said second electrical position encoder and applied with the output signal of said second electrical position encoder,

said adjusting device includes a coupling means operatively connected to said positioning actuator,

said element and said regulating unit constitute corresponding members,

means for detecting a resetting speed of one of said members,

means for triggering said coupling means in a sense of disconnection thereof sooner than actuation of the vehicle clutch and/or of the vehicle brake, said triggering means being operatively connected to said detecting means and for triggering said coupling means in the sense of disconnection upon exeeding a certain predetermined value of the resetting speed.

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**4,313,409**

## CENTRIFUGAL RPM GOVERNOR FOR FUEL-INJECTED INTERNAL COMBUSTION ENGINES

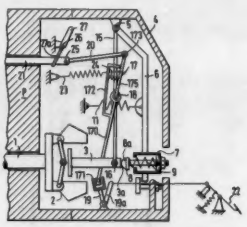
**Niro Makino, Toyota, Japan, assignor to Nippondenso Co. Ltd., Kariya, Japan**

**Filed Oct. 24, 1979, Ser. No. 87,895**

**Claims priority, application Japan, Oct. 24, 1978, 53-146546[U]**

**Int. Cl.³ F02D *31/00***

**U.S. Cl. 123—373** **3 Claims**



1. A centrifugal rpm governor for fuel-injected Diesel engines, comprising

a control member displaceable in position by the force of flyweights,

a control linkage arranged to transmit a signal indicative of the change in position of said control member onto a supply quantity adjustment member,

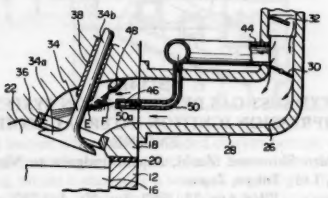
a shut-off lever associated with said supply quantity adjustment member arranged to be moved into an operational position by a tension spring to turn off said engine,

a deviation spring means arranged to prevent overstressing of said control linkage upon actuation of said shut-off lever, and said deviation spring means including a holding spring and a deviation spring, said holding spring being disposed on said shut-off lever so that said shut-off lever is held by said holding spring, both in said operational position and a shut-off position and that the force with which said shut-off lever is held in its shut-off position is greater than the force of said deviation spring.

## 4,313,410
## INTERNAL COMBUSTION ENGINE WITH FUEL INJECTOR

**Kazuya Kunii; Saburo Tsutsumi, both of Yokohama, and Shizuo Ishizawa, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Division of Ser. No. 27,141, Apr. 4, 1979, Pat. No. 4,269,153.**
**This application Oct. 17, 1980, Ser. No. 197,822**
**Claims priority, application Japan, May 15, 1978, 53/50416**
**Int. Cl.³ F02B *15/00***
**U.S. Cl. 123—432** **3 Claims**




1. An internal combustion engine having a combustion chamber and an intake valve seatable on a valve seat, comprising:

means for defining an intake passageway through which the combustion chamber is communicable with atmospheric air, a throttle valve being pivotally disposed in said intake passageway;

a fuel injector including a fuel injection nozzle which is projected into the intake passageway downstream of the throttle valve and immediately upstream of the combustion chamber;

means defining a straight elongate opening located adjacent the nozzle of said fuel injector, the axis of said straight elongate opening intersecting the axis of the nozzle of said fuel injector at a predetermined angle;

means defining an additional air passage through which said elongate opening is communicable with said intake passageway upstream of said throttle valve said straight elongate opening defining means including a pipe projecting into the intake passageway downstream of said throttle valve, said pipe being formed with a straight elongate portion in which said straight elongate opening is formed, the tip of said straight elongate portion being located immediately upstream of the combustion chamber.

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## 4,313,411
## FUEL FEEDING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

**Akinobu Moriyama, Yokosuka; Mitsumasa Inoue, Yokohama; Masaaki Saito, Yokosuka, and Yoshihisa Kawamura, Fujisawa, all of Japan, assignors to Nissan Motor Company, Yokohama, Japan**

**Filed Oct. 5, 1979, Ser. No. 82,335**
**Claims priority, application Japan, Oct. 9, 1978, 53-124420; Nov. 22, 1978, 53-161216[U]**
**Int. Cl.³ F02M *61/14***
**U.S. Cl. 123—445** **6 Claims**

1. A fuel feeding device for a multi-cylinder type internal combustion engine, comprising:

a tubular throttle body having an intake passage;

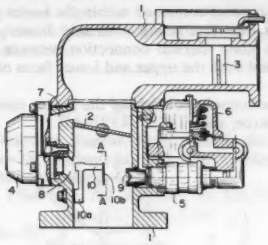
a throttle valve provided within said intake passage;

a bypass formed around said throttle valve, said bypass having an air passage inlet to said intake passage upstream of said throttle valve and an air passage outlet to the intake passage downstream of said throttle valve;

an air regulator for regulating air flow through said bypass;

a valve having a nozzle for injecting fuel into said intake passage downstream of said throttle valve; and

an atomizer located near said air passage outlet, said atomizer having at a base portion thereof a support portion fixed to said tubular throttle body said atomizer further having a reflecting planar surface disposed between said




air passage outlet and said nozzle of said fuel injecting valve, said nozzle facing said reflecting planar surface.

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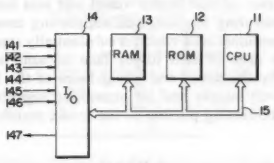
## 4,313,412
## FUEL SUPPLY CONTROL SYSTEM

**Akio Hosaka, Yokohama, and Masaharu Asano, Yokosuka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan**

**Filed Mar. 18, 1980, Ser. No. 131,094**
**Claims priority, application Japan, Mar. 19, 1979, 54-31191**
**Int. Cl.³ F02B *3/00***
**U.S. Cl. 123—480** **7 Claims**




1. In a fuel supply control system for use in an internal combustion engine, said system using a stored program type digital computer for calculating a basic amount of fuel and said system modifying the basic amount of fuel in accordance with various correction factors dependent upon engine operating conditions so as to determine an actual amount of fuel to be supplied to the engine, an improvement in the fuel supply control system comprising:

means for summing all correction factors dependent upon engine temperature; and

means for multiplying the sum of said correction factors by said basic amount of fuel so as to determine said actual amount of fuel, said fuel supply control system further including means for increasing or decreasing each of said correction factors by a value proportional to the amount of fuel supplied to the engine or the intake air flow rate.

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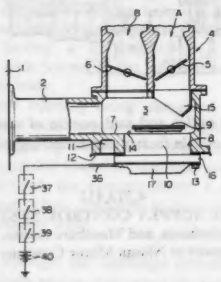
## 4,313,413
## FUEL VAPORIZATION PROMOTING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

**Takeo Miyoshi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Nov. 14, 1979, Ser. No. 93,999**
**Claims priority, application Japan, Sep. 7, 1979, 54-114100**
**Int. Cl.³ F02M *31/00***
**U.S. Cl. 123—549** **16 Claims**

1. A fuel vaporization promoting device for an internal combustion engine having an intake manifold with a collecting portion, and a carburetor arranged above the collecting portion, said device comprising:

a power source;
a thin plate-shaped heater vessel having a substantially flat upper face and a substantially flat lower face;
a heater element contained within the heater vessel;
resilient means also contained within the heater vessel, said resilient means interacting with said heater element to provide a good thermal connection between the heater element and both the upper and lower faces of the heater vessel;
means for selectively connecting the heater element to the power source; and



supporting means interconnecting the lower face of said heater vessel in spaced relation above a bottom wall of said collecting portion for forming an air gap between said lower face of said heater vessel and said bottom wall of said collecting portion, said supporting means having a cross-sectional area which is substantially smaller than the surface area of said lower face of said heater vessel, whereby the upper and lower faces of the heater vessel effectively supply heat for promoting vaporization of fuel in the collecting portion of the intake manifold.

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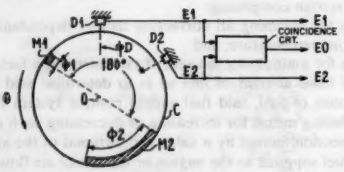
**4,313,414**

## SHAFT POSITION SENSOR FOR AN INTERNAL COMBUSTION ENGINE EQUIPPED WITH AN ELECTRONIC IGNITION SYSTEM

**Pierre Planteline, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Jan. 14, 1980, Ser. No. 111,994**
**Int. Cl.³ F02P** *5/04, 1/00*
**U.S. Cl. 123—643** **5 Claims**




1. A shaft position sensor for synchronizing the electronic ignition system of a multicylinder internal combustion engine said electronic ignition system comprising at least one double-channel automatic advance circuit, an electronic distributor, and a plurality of spark generators connected to respective ones of the spark plugs mounted in said cylinders, said sensor comprising:

(1) electromechanical sensing means including: a set of conducting members, rotated synchronously about an axis of rotation of the engine, said set of members including at least two main members and at least one auxiliary member angularly displaced ahead of one of the main members by a given angle; and first and second fixed proximity detectors, spatially disposed with regard to the course of the members, the relative angular spacing of said detectors being equal to the difference between the value of the maximum dynamic lead angle and the value of the static lead angle; and,

(2) electronic means for processing the signals generated by said detectors, said processing means including: a temporal coincidence circuit connected to the output signals of said detectors; and a circuit for inhibiting the electric signals resulting from the passage of said auxiliary member past said detectors.

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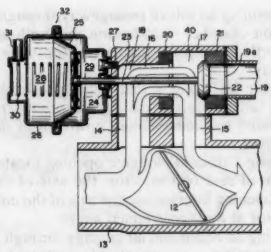
**4,313,415**

## EXHAUST GAS RECIRCULATION SYSTEM IN COMPRESSION-IGNITION INTERNAL COMBUSTION ENGINE

**Motohiro Shinzawa, Zushi, Japan, assignor to Nissan Motor Co., Ltd., Tokyo, Japan**

**Filed Apr. 25, 1980, Ser. No. 143,737**
**Claims priority, application Japan, Jun. 14, 1979, 54-81322[U]**
**Int. Cl.³ F02M** *25/06*
**U.S. Cl. 123—569** **9 Claims**



1. A system for recirculation of exhaust gases in a compression-ignition internal combustion engine having an induction passage for air flow to the engine, an exhaust passage for exhaust gas flow from the engine and a throttle valve disposed in the induction passage, the system comprising:

an exhaust gas recirculation passage connecting the exhaust passage with the induction passage downstream of the throttle valve,

a by-pass passage connecting two portions of the induction passage to detour the throttle valve,

said exhaust gas recirculation passage and said by-pass passage being arranged to join together forming a junction portion having a first inlet opening from said by-pass passage, a second inlet opening from said exhaust gas recirculation passage and an outlet communicating with the induction passage downstream of the throttle valve,

valve means disposed in said junction portion, said valve means having a first position where said second inlet is closed and said first inlet is open to connect said by-pass passage to the induction passage downstream of the throttle valve and a second position where said first inlet is closed and said second inlet is open to connect said exhaust gas recirculation passage to the induction passage downstream of the throttle valve,

a plurality of sensors each for sensing a parameter of engine operating conditions and producing an electric signal representing the sensed parameter, and

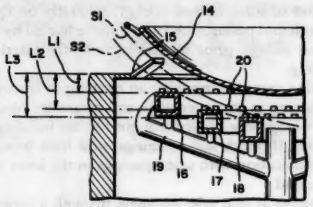
valve actuating means for shifting the position of said valve means between said first and second positions in accordance with an engine operating condition indicated by the signals produced by said sensors.

**4,313,416**

## WOK BURNER

**Ka K. Lau, 3636 Veteran Ave., Los Angeles, Calif. 90034**

**Filed Sep. 4, 1979, Ser. No. 72,320**
**Int. Cl.³ F24C *3/00*; F27D *11/00*; H05B *3/68***
**U.S. Cl. 126—39 E** **1 Claim**




1. A wok burner wherein the rounded convex bottom of the wok has a given radius of curvature, said burner comprising:

(a) heating means comprising a series of concentric rings of decreasing radii when viewed in plan and at successively lower levels when viewed in elevation to define a concave surface of radius of curvature at least equal to the radius of curvature of said wok for receiving said wok, said rings having jet gas openings for emitting gas, and

(b) supporting flanges circumferentially spaced about the periphery of said heating means for holding said wok with its bottom convex exterior surface received at least partially within said concave surface so that the central and outer areas of the bottom of said wok are substantially uniformly spaced from said heating means whereby the bottom of said wok receives substantially uniform heat over a major portion of its surface.

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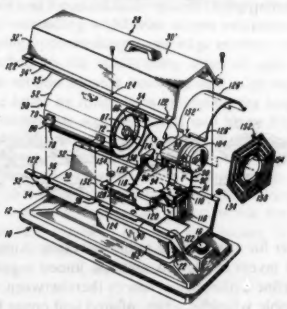
**4,313,417**

## PORTABLE SPACE HEATER

**Eugene C. Briggs, and Robert F. Shaftner, both of Bowling Green, Ky., assignors to Koehring Company, Milwaukee, Wis.**

**Filed Jul. 9, 1979, Ser. No. 56,014**
**Int. Cl.³ F24H *3/02*, *1/00***
**U.S. Cl. 126—110 B** **29 Claims**



1. A portable heater comprising a housing composed of separate parts including a lower part having a bottom and side wall portions defining a trough, components of said heater including a combustion chamber assembly and a support, said support positioning in a sense transverse to said lower part, said combustion chamber assembly and said support having in connection therewith means for seating to and interfitting with means in connection with said side wall portions of said lower part in a drop fit thereof to said lower part, said support mounting thereon a motor and a fan blade assembly for powering said heater and developing therein a pressured flow of air to and about said combustion chamber assembly and means for delivering fuel and igniting the fuel in delivery thereof to the combustion chamber of said assembly, said interfitting means being constructed and arranged to position said combustion chamber assembly and said support and said fan blade assembly in a substantially direct alignment on and within said lower part of said housing and to inhibit relative longitudinal and lateral motion therebetween.

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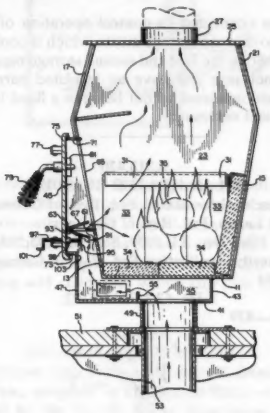
**4,313,418**

## DAMPER CONTROL

**Charles I. Schrader, Eugene, Oreg., and Janice E. Schrader, 2296 Debra Dr., Springfield, Oreg. 97477, assignors to Janice E. Schrader, Springfield, Oreg.**

**Filed Mar. 18, 1980, Ser. No. 131,477**
**Int. Cl.³ F24C *1/14***
**U.S. Cl. 126—287** **7 Claims**



1. A wood stove having a main housing defining an interior fuel combustion chamber within which fuel is burned and combustion air delivery means defining an air passageway for the passage of combustion air upwardly beneath the main housing and to the fuel combustion chamber,

said combustion air delivery means providing a damper opening communicating with the interior combustion chamber of the housing,

a damper door pivotally mounted to said combustion air delivery means for movement from a closed position relative to said damper opening to various open positions,

means defining a main fuel receiving opening at the front of the stove through which fuel is deposited into the fuel combustion chamber,

a stove door for closing the fuel receiving opening and being mounted for movement from a closed position to an open position, and

damper control means carried by said stove door for controlling the position of said damper door.

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**4,313,419**

## SOLAR HEATING SYSTEM

**Floyd A. Lyon, Brookville; William H. Yale, and Donald Lyon, both of Locust Valley, all of N.Y., assignors to Halm Instrument Co., Inc., Glen Head, N.Y.**

**Filed Apr. 21, 1980, Ser. No. 142,337**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—421** **2 Claims**

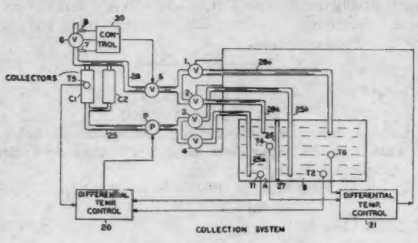
1. Solar heating collection system comprising:

a solar collector building heating means,

a double storage means comprising first and second storage means connected to the collector and the building heating means,

the first storage means having a capacity for approximately one days operation,

the second storage means having a capacity for several days operation,




and means connected to control operation of the storage means so that the storage means which is coolest is heated first, wherein the first and second storage means are in the same enclosure and have an insulated barrier between them, said insulated barrier being in a fixed location relative to said enclosure.

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**4,313,420**

**SOLAR HEATED BUILDING**

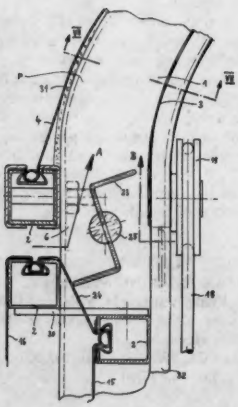
**Guenter Poeschl, Schwaikeim, Fed. Rep. of Germany, assignor to Helmut Lamm, Fed. Rep. of Germany**

**Filed Dec. 13, 1979, Ser. No. 103,203**

**Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2855154**

**Int. Cl.³ F24J** *3/02*

**U.S. Cl. 126—429** **19 Claims**



1. A solar heated building comprising;

a frame;

an inner wall supported by the frame;

an outer wall of generally transparent material supported by the frame and spaced outwardly of said inner wall thereby defining a passage therebetween;

said passage having an inlet for flow of air into the passage and an outlet in communication with the interior of the building for flow of air from the passage into the interior of the building;

said inner and outer walls being positioned for incidence thereon of solar radiant energy, whereby on flow of air through said passage the latter may be heated by said solar radiant energy prior to flowing into the interior of the building;

ventilation means comprising an opening in the outer wall, an opening in the inner wall, and means for blocking and unblocking flow of air from outside the building into the building through said openings, said inlet being in flow communication with said openings in the inner and outer walls; and

valve means at said inlet movable through a series of positions and being so sized and configured relative to said inlet and said ventilation means as to block flow of air from both the interior and the exterior of the building into the passage when in a first position, to enable flow of air only from the exterior of the building into the passage when in a second position, to enable flow of air only from the interior of the building into the passage when in a third position, and to enable flow of air from both the interior and the exterior of the building into the passage when in a fourth position.

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**4,313,421**

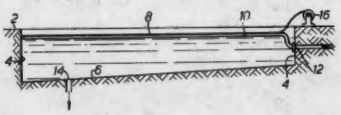
**SOLAR HEATING APPARATUS FOR SWIMMING POOLS**

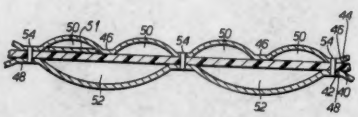
**John M. Trihey, Bayswater, Australia, assignor to Vulcan Australia Limited, Burwood, Australia**

**Continuation of Ser. No. 940,347, Sep. 6, 1978, abandoned. This application Jul. 22, 1980, Ser. No. 171,108**

**Int. Cl.³ F24J** *3/02;* **E04H** *3/19*

**U.S. Cl. 126—415** **6 Claims**





1. A cover for a swimming pool, said cover comprising first and second layers of plastics material joined together at join zones, to define a plurality of spaces therebetween, said spaces being inflatable whereby when inflated said cover floats when placed on the surface of a pool with said second layer lowermost, at least said second layer being distended away from said join zones and having downwardly projecting crests when inflated which contact the surface of the pool and support said join zones above the surface of the pool to define airspaces between the surface of the pool and adjacent crests, and wherein drainage holes are provided extending through the first and second layers at said join zones communicating between the top surface of the cover and the airspaces defined between adjacent crests in said second layer and the surface of the pool, and spiral springs are provided operably connected to said layers and having a predetermined spring force to unroll

the cover upon inflation of said spaces and to roll up the cover upon deflation of said spaces.

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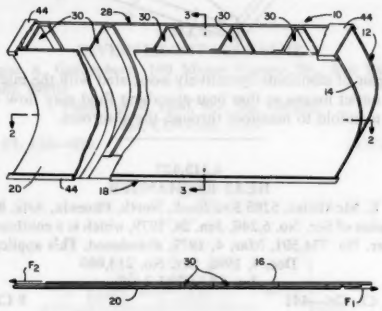
**4,313,422**

## COLLAPSIBLE STRUCTURAL ASSEMBLY ESPECIALLY SUITABLE AS A SOLAR CONCENTRATOR

**John F. McEntee, Boulder Creek, Calif., assignor to Acurex Solar Corporation, Mountain View, Calif.**

**Filed Sep. 25, 1980, Ser. No. 190,497**
**Int. Cl.³ F24J *3/02*; G02B *5/10***
**U.S. Cl. 126—426** **1 Claim**




1. A collapsible solar concentrator especially suitable as part of an overall solar collector, said solar concentrator comprising: an elongated, flexible backing sheets having a frontside and an opposite backside; an elongated, flexible front sheet having a light reflective frontside and an opposite backside disposed in confronting relationship with the frontside of said backing sheet; means located between and connected with said sheets so as to support the sheets as a single unit so that said unit is capable of movement between a collapsed position such that the sheets lie flat and adjacent to one another with the support means therebetween and a second extended position such that said sheets have parabolic cross sections in predetermined parallel planes extending through the sheets perpendicular thereto, said support means including a plurality of integrally formed and longitudinally spaced elongated ribs located between and extending widthwise across said sheets, each of said ribs having opposite lengthwise edge sections respectively fixedly attached to the confronting sides of said sheets, an intermediate section located between said edge sections and joined to the latter by hinge lines extending the length of said edge and intermediate sections, all of said hinge lines forming part of said ribs displaying a predesigned curved configuration when said sheets are in said collapsed position which determines said parabolic cross-sections of said sheets when the latter are in said extended position, said ribs serving as structural reinforcement between said sheets when the latter are maintained in said extended position; and means for maintaining said sheets in said extended position.

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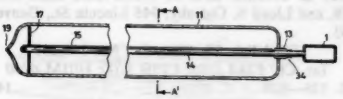
**4,313,423**

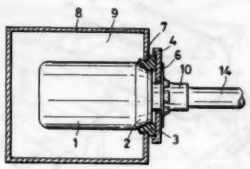
## SOLAR COLLECTOR WITH HEAT PIPE

**Faramarz S. Mahdjuri, Via S. Sebastiano 33, Bergamo, Italy**

**Filed May 21, 1979, Ser. No. 40,522**
**Claims priority, application Switzerland, Jun. 2, 1978, 6034/78**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—433** **10 Claims**

1. A collector for solar radiation, said collector comprising an elongated tube having a closed end and an open end, and a vaporizable heat-transferring medium therein, absorber means at one end of said tube and a condenser connected to said open end of said tube, said condenser having a conical end portion and a larger cross-sectional dimension than that of said elongated tube; a flow channel having a heat-transfer medium therein, said flow channel having a planar wall portion having an exterior surface and an opening therein; a resilient annular gasket, said gasket including a tubular portion and a flange portion, said tubular portion extending through said opening in




said wall portion with said flanged portion abutting said wall portion around said opening, and clamp means carried by said condenser externally of said channel drawing said condenser conical end portion against the planar wall portion while pressing said flange portion against said exterior of said wall portion thereby sealing said condenser within said flow channel.

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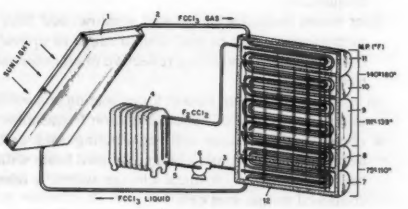
**4,313,424**

## SOLAR HEATING SYSTEM

**James M. Schreyer, Oak Ridge, and George F. Dorsey, Concord, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed May 16, 1980, Ser. No. 150,394**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—433** **5 Claims**




1. In combination,

solar-collector means for supplying heated vaporized refrigerant at a range of temperatures, said range reflecting variations in the climatic and atmospheric conditions to which said panel is exposed,

a heat-storage device including a generally vertical array of insulated compartments respectively containing heat-storage materials having different melting points which collectively (a) span said range and (b) define a decreasing stepwise gradient from the top compartment to the bottom compartment,

natural-convection loop means for conveying heated refrigerant from said panel downwardly through said array for condensation therein, and for returning liquid refrigerant to said panel,

a heat exchanger for heating an enclosure, and

means for circulating a heat-exchange fluid through said

array of compartments countercurrently to said refrigerant and through said heat exchanger.

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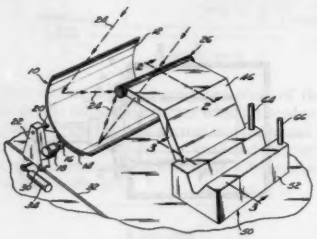
4,313,425

## SPECTRAL CONVERTOR

Lawrence E. Crackel, 1245 S. Welch Cir., Lakewood, Colo. 80228, and Lloyd S. Oglesby, 945 Lincoln St., Denver, Colo. 80203

Filed Feb. 28, 1980, Ser. No. 125,258
Int. Cl.³ F24J 3/02; C25B 3/00; H01M 6/30
U.S. Cl. 126—438 14 Claims



1. A spectral convertor comprising:
a solar radiation concentrator able to receive and to direct full spectrum solar radiation and concentrate said solar radiation in a given area;
a heat collector mounted within a given area, said heat collector comprising an internal chamber enclosed by a thin wall, said thin wall permitting conduction of the energy of said full spectrum solar radiation into said internal chamber as heat;
a substance located within said chamber, said substance being reactive to said full spectrum solar radiation which results in the radiating from said substance a desired range of optical radiation frequencies;
a window mounted within said thin wall, said window permitting passage of said desired range of optical radiation frequencies;
filter means located adjacent said window, said filter means permitting passage of said desired range of optical radiation frequencies and being reflective of all other radiation frequencies;
an optical management system for collecting and collimating said desired range of optical radiation frequencies; and
a chemical dissociation cell, conducting said collimated beam into said cell, using said collimated beam within said cell to produce a chemical change within a compound contained within said cell.

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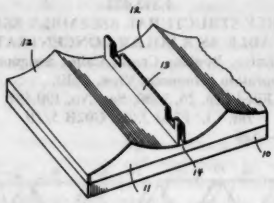
4,313,426

## SOLAR ENERGY COLLECTOR

William P. Niedermeyer, 1024 Mt. Mary Dr., Green Bay, Wis. 54301

Continuation-in-part of Ser. No. 886,217, Mar. 13, 1978, abandoned. This application Nov. 19, 1980, Ser. No. 208,220
Int. Cl.³ F24J 3/02
U.S. Cl. 126—438 3 Claims

1. A concentrating solar energy collector including:
a continuous shaped sheet, a support surface, and an underlying support;
said continuous sheet integrally forming a plurality of reflectors and heat absorbers;
said reflectors being parabolically curved with an absorber at the nadir of each reflector;
said absorber being an inverted generally u-shaped channel;
a closure along the open edge of the channel to provide a closed conduit;
inlet and outlet means at the ends of each absorber;



a pair of manifolds operatively associated with the inlet and outlet means so that heat-absorbing fluid may flow from manifold to manifold through the absorbers.

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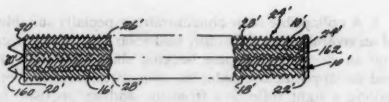
4,313,427

## HEAT EXCHANGER

Roy E. McAlister, 5285 Red Rock, North, Phoenix, Ariz. 85018

Division of Ser. No. 6,240, Jan. 24, 1979, which is a continuation of Ser. No. 774,501, Mar. 4, 1977, abandoned. This application Dec. 4, 1980, Ser. No. 213,080
Int. Cl.³ F24J 3/02
U.S. Cl. 126—441 8 Claims



1. A solar energy heat exchanger comprising
a plurality of thin imperforate webs of rigid heat conducting material,
each of said webs having a pair of relatively wide opposed surfaces bounded in one direction by a pair of spaced relatively thin edges so as to provide said web with a cross-sectional configuration which is elongated in a direction transverse to said one direction,
said webs being generally transversely aligned and disposed in a layer formation in which each of the surfaces of each web is disposed in facing relation to the opposite surface of an adjacent web in the layer formation,
each pair of facing surfaces including passage defining portions and force transmitting portions,
certain of the webs having both end edges thereof sealingly secured to the corresponding end edges of an adjacent web so as to define with the passage defining portions of the facing surface associated therewith first fluid passage means having a flow direction extending generally in said one direction along said webs,
certain of said webs having at least one end edge thereof disposed out of sealing engagement with a corresponding end edge of the adjacent web so as to define with the passage defining portions of the facing surfaces associated therewith solar energy passage means extending transversely inwardly of the aforesaid one end edges of said webs toward the opposite end edges thereof,
means on the aforesaid one end edges of said webs for facilitating passage of solar energy into said solar energy passage means for absorption and multiple reflection therein,
means on said opposite end edges of said webs for retarding the passage of solar energy from said solar energy passage means outwardly of said opposite end edges,
the force transmitting portions of each pair of facing surfaces being disposed in force transmitting relation with respect to one another in the direction said facing surfaces face one another so that forces created by the fluid pressure

and temperature conditions within said fluid passage means tending to deform said webs in said facing directions are resisted to thereby prevent deformation which would otherwise occur in the absence of said force transmitting relationship and permit the utilization of wall thicknesses less than that required to be self-sustaining in order to prevent such deformation, and

means for directing first fluid means into and out of said first fluid passage means.

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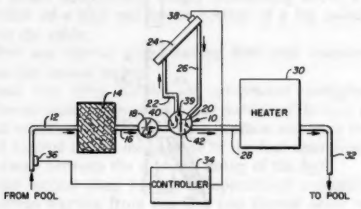
**4,313,428**

## DIVERTER/BYPASS VALVE

**Enrique A. Goldenberg, 140 Mount Lassen Dr., San Rafael, Calif. 94903**

**Filed Feb. 4, 1980, Ser. No. 118,352**
**Int. Cl.³ F16K *1/22***
**U.S. Cl. 126—422** **14 Claims**




1. A diverter/bypass valve comprising:

a housing including a chamber which is rotationally symmetric about one axis;

a damper mounted within the housing so that the damper is rotatable about the axis of the chamber;

a pair of movable stops adapted to enable the damper to rotate in a preferred direction and to stop in either of two positions, one such position being a diversion position and the other such position being a bypass position;

a primary inlet in the housing having an axis offset from the axis of the chamber so that the fluid entering the chamber through the primary inlet tends to rotate the damper in the preferred direction;

a diversion outlet located in the housing so that the damper prevents fluid communication from the primary inlet to the diversion outlet through the chamber when the damper is in its bypass position, and allows such communication in its diversion position;

a diversion inlet located in the housing so that the damper prevents fluid communication from the primary inlet to the diversion inlet through the chamber in both its diversion and bypass positions, and prevents fluid communication from the diversion outlet to the diversion inlet through the chamber in its diversion position; and

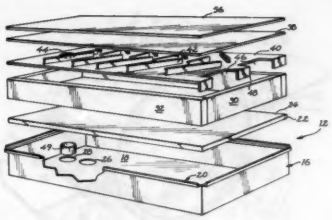
a primary outlet located in the housing so that the damper allows fluid communication from the diversion inlet to the primary outlet through the chamber when the damper is in its diversion position, and allows fluid communication from the primary inlet to the primary outlet through the chamber when the damper is in its bypass position, so that a fluid entering the chamber with the damper in the diversion position exits the chamber through the diversion outlet, while fluid entering the chamber through the diversion inlet exits the chamber through the primary outlet, and a fluid entering the chamber with the damper in the bypass position leaves the chamber directly through the primary outlet.

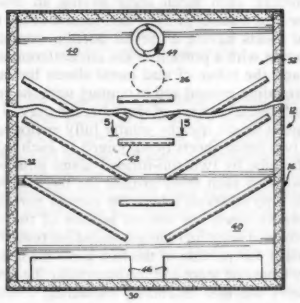
**4,313,429**

## SOLAR AIR COLLECTOR

**Robert J. McAlaster, 1593 Pioneer, Talent, Oreg. 97540**

**Filed May 19, 1980, Ser. No. 151,277**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—445** **3 Claims**





1. Self-contained solar heat collecting unit adapted to be placed against a structure, said unit comprising

an elongate enclosure having an inner backing and upstanding side walls whose interior surfaces are lined with insulation, and an outer transparent glazing,

supported within said enclosure, an inner, elongate heat-conductive panel having an outer surface and an inner surface confronting and spaced from said backing, said panel being dimensioned to form with the insulation-lined interior surfaces of said backing and side walls, an elongate inner air plenum,

a plurality of upstanding heat-conductive baffles mounted on said panel's outer surface in heat-conductive relationship therewith, and arranged thereon for creating air turbulence in a stream of air flowing in an end-to-end direction across said outer surface,

an outer elongate solar collecting heat-conductive panel supported in said enclosure by said baffles, in heat-conductive relationship therewith, at a position spaced from said outer surface, said outer panel being dimensioned to form with said inner panel's outer surface and insulation-lined interior surfaces of said side walls, an elongate outer air plenum,

means in said inner panel, adjacent one end of said unit, communicating said inner and outer plenums, and

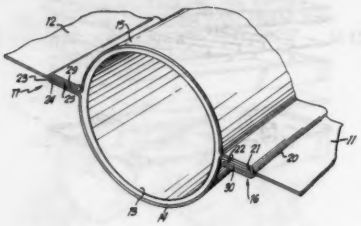
an inlet and an outlet adjacent the unit's other end communicating the exterior of said enclosure with said inner and outer plenums, respectively.

**4,313,430**

## SOLAR ENERGY ABSORBING-HEAT EXCHANGER DEVICE

**George F. Britner, Old Greenwich, Conn., and John A. Zivic, Santa Ana, Calif., assignors to Phelps Dodge Industries, Inc., New York, N.Y.**

**Filed Sep. 26, 1979, Ser. No. 79,165**
**Int. Cl.³ F24J 3/02**
**U.S. Cl. 126—446** **7 Claims**



**1.** A solar energy absorbing-heat exchanger device, comprising in combination: a metal tube; first and second thin metal sheet members; each metal sheet having an essentially flat portion for heat transfer outside the location of the tube; one of said metal sheets having a curved portion extending around and in contact with a portion of the circumferential surface of the tube and the other of said metal sheets having a curved portion extending around and in contact with the remainder of the circumferential surface of the tube, the curved portions of the two metal sheets thereby jointly fully enclosing the metal tube; the two metal sheets being joined to each other to fully enclose the tube by two roll-formed seams adjacent the tube and spaced from each other around the circumference of the tube at the two positions where the curved portion of one of the two sheets meets the curved portion of the other sheet; each roll-formed seam including a folded portion of each sheet, the essentially flat portion of the first sheet member extending outwardly from one seam and the essentially flat portion of the second sheet member extending outwardly from the other seam; each of the two seams extending parallel to the tube and being comprised of an end of one of the sheet members being folded back upon itself to form a channel within which a folded intermediate portion of the other sheet member is tightly secured; and, the first sheet member having its folded end at one of the two seams and securing the folded intermediate portion of the second sheet member, the second sheet member having its folded end at the other of the two seams and securing the folded intermediate portion of the first sheet member.

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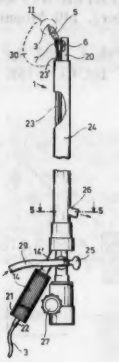
**4,313,431**

## ENDOSCOPIC APPARATUS WITH A LASER LIGHT CONDUCTOR

**Frank Frank, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany**

**Filed Nov. 26, 1979, Ser. No. 97,200**
**Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852653; Nov. 8, 1979, 2945080**
**Int. Cl.³ A61B 1/06, 1/12**
**U.S. Cl. 128—7** **10 Claims**

**1.** An endoscopic bladder tumor treating apparatus using a laser radiation for said treating, comprising optical fiber light conductor means having an input end and an output end for transmitting a tumor treating laser radiation through said optical fiber light conductor means, endoscopic viewing means operatively arranged in parallel to said optical fiber light conductor means for inspecting an interior bladder wall, rigid sleeve means **(5)** operatively secured to said output end of said laser radiation transmitting optical fiber light conductor means for protecting said output end of the laser radiation transmitting optical fiber light conductor means against destruction by said tumor treating laser radiation, hinging means operatively secured to said rigid sleeve means, and manipulating means extending from said input end operatively connected to said hinging means for manipulating said output end substantially from said input end, said apparatus further comprising support means for slidably supporting said laser radiation transmitting optical fiber light conducting means in said rigid sleeve for axial displacement in said rigid sleeve means, shifting means operatively connected to said laser radiation transmitting optical fiber light conductor means, said shifting means being arranged adjacent said input end of said laser radiation transmitting optical fiber light conductor means, protective jacket means **(2)** operatively enclosing said laser radiation transmitting optical fiber light conductor means **(3)** except for said output end held by said rigid sleeve **(5)**, said shifting means comprising slide bearing means **(17)**, said light conductor means **(3)** with its jacket means **(2)** being operatively secured to said slide bearing means **(17)**, said shifting means further comprising housing means **(16, 21)** holding said slide bearing means and spring means **(19)** also held in said housing means for biasing said slide bearing means into a starting position, said shifting means being operable to adjust said output end of said laser radiation transmitting optical fiber light conductor means **(3)** into a tumor treatment position whereby said output end is substantially recessed in said rigid sleeve **(5)** and into an output end cleaning position wherein said output end protrudes from said rigid sleeve **(5)**.



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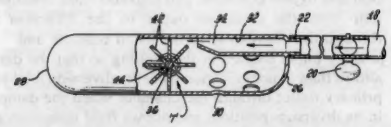
**4,313,432**

## WATER DRIVEN PERSONAL MASSAGER

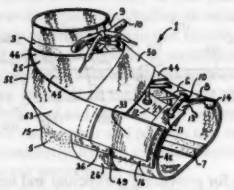
**George K. Sievers, 1110 Kenwood St., Burbank, Calif. 91505**

**Filed Sep. 24, 1979, Ser. No. 77,892**
**Int. Cl.³ A61H 9/00**
**U.S. Cl. 128—37** **16 Claims**



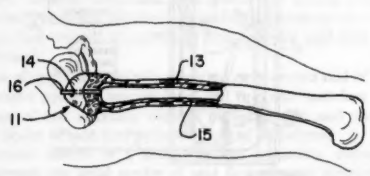
**1.** Water driven personal massager for use in spas, hot tubs and like open-topped water enclosures suitable for bathing and having a pressurized water supply, comprising means defining a flow passage providing a restricted flow path for said supply pressurized water, pulsating means across said flow path comprising a turbine having a circular series of vanes on a common shaft, and radially disposed weights fixed to said shaft on opposite sides of said turbine vanes and in a common plane with each other and with one of said vanes.

4,313,433
ANKLE STABILIZER
Charles W. Cramer, Overland Park, Kans., assignor to Cramer Products, Inc., Gardner, Kans.
Filed Oct. 9, 1979, Ser. No. 82,980
Int. Cl.³ A61F 3/00
U.S. Cl. 128—80 H 15 Claims



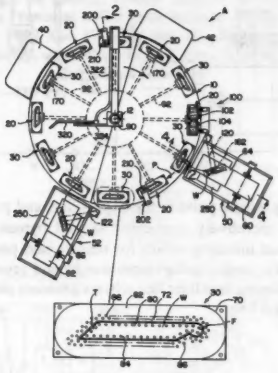
1. A stabilizer for a human ankle comprising:
(a) a jacket adapted for snugly positioning about a rear portion of a foot and lower portion of a leg associated with the ankle;
(b) first and second straps having first ends respectively attached to said jacket;
(c) said first strap having an operational configuration wherein same wraps about a rear portion of the foot when said stabilizer is in the operative position and has a second end located on the medial side of the foot approximately midway between the sole and instep of the foot;
(d) said second strap having an operational configuration wherein starting from the first end thereof same wraps sequentially up the lateral side of the foot, over the instep of the foot, around the rear of the foot above the heel thereof, and along the lateral side of the foot substantially over the lateral ligaments associated therewith; said second strap ending on the lateral side of the foot approximately midway between the sole and instep of the foot; and
(e) reusable first and second fastening means located on the medial and lateral sides of the foot respectively when said first and second straps are in the operational configuration thereof approximately midway between the sole and the instep of the foot for securely connecting said first and second straps in the respective configuration thereof.

4,313,434
FRACTURE FIXATION
David Segal, 229 Fuller St., West Newton, Mass. 02165
Filed Oct. 17, 1980, Ser. No. 197,794
Int. Cl.³ A61B 17/18; A61F 5/04
U.S. Cl. 128—92 BC 11 Claims




1. A method of long bone fixation which method includes the steps of,
forming an opening in a long bone extending from the outside of the bone into the medullary cavity,
inserting a deflated flexible bladder through said opening into said medullary cavity,
and then inflating said bladder until the inflated bladder firmly engages the walls of said medullary cavity to provide fixation of said long bone.

4,313,435
APPARATUS AND METHOD OF PRODUCING A SUCCESSION OF DIE CUT TOBACCO BLANKS
Frederick D. Godfrey, Jr., Maple Wood, N.J., assignor to Gulf & Western Corporation, New York, N.Y.
Filed Apr. 18, 1980, Ser. No. 141,333
Int. Cl.³ A24C 1/28
U.S. Cl. 128—105 19 Claims

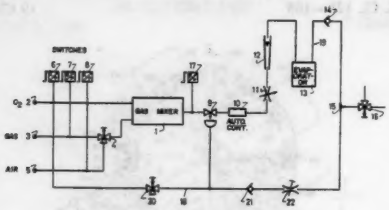


1. A device for supplying a succession of die cut tobacco blanks with a given profile to a web of a coiled type, storage bobbin, said device comprising: a set of a plurality of die cut stations each of said plurality of stations including a cutting die blade with an upstanding cutting edge matching said profile and vacuum means surrounding said edge for capturing a tobacco sheet material on said station in a position overlying said edge; means for moving said set of stations in unison along an endless, preselected path; cutting means at a first selected, generally fixed position in said path for cutting a tobacco blank from a manually placed tobacco sheet captured on a given station of said set by said vacuum means as a station passes said first selected position, said cutting means including a roller generally fixed in the direction of said path and engageable by said cutting edge as a station passes first selected position; profile releasing means at a second selected, generally fixed position in said path and subsequently located in said path with respect to said first position for releasing a die cut profile from a station at said second position; transfer means at said second position for transferring a die cut profile from its station to said web of a coiled type storage bobbin and a fixed loading position for placing a tobacco sheet onto one of said stations of said set, said loading position being spaced from said first and second positions.

4,313,436
FRESH GAS DEVICE WITH MIXER FOR MEDICAL AND RESPIRATION APPARATUS
Erik Schwanbom, and Karl Hickmann, both of Lübeck, Fed. Rep. of Germany, assignors to Dragerwerk Aktiengesellschaft, Fed. Rep. of Germany
Filed Oct. 20, 1980, Ser. No. 198,818
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1979, 2945575
Int. Cl.³ A61M 16/00
U.S. Cl. 128—203.12 5 Claims

1. An improved fresh gas device of the type comprising a gas mixer having a first inlet line adapted to be connected to a source of oxygen and a second inlet line adapted to be connected to a source of at least one other gas for mixing oxygen and that at least one other gas to form a gas mixture to be supplied to a patient via a patient supply apparatus and said gas mixer having an outlet line adapted to be connected to the

patient supply apparatus for passing the gas mixture thereto, the improvement comprising, valve means located in the outlet line for opening and closing the flow path to the apparatus, a bypass line in a parallel flow path with the mixer connected between the inlet line and the outlet line, means for manually



initiating a pressure pulse in the bypass line, and pressure-sensing means operatively connected to said bypass line downstream of said initiating means for sensing said pressure pulse, and said valve means being responsive to said pressure sensing means for closing said inlet line when a pressure pulse is sensed in said bypass line.

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**4,313,437**

## TRACHEOTOMY AND ENDOTRACHEAL TUBE RETAINERS

**Dianne L. Martin, 3903 Barrington, Apt. 301, San Antonio, Tex. 78217**

**Filed Oct. 1, 1979, Ser. No. 80,982**
**Int. Cl.³ A61M *25/02***
**U.S. Cl. 128—207.17** **7 Claims**

1. An intubation tube retainer to be used in conjunction with a tracheotomy or endotracheal tube holder having slots in either end thereof to secure a tracheotomy or endotracheal tube to a patient, said retainer comprising:

a. an elongated, elastic body having a first end and a second end;

b. a first attaching tape secured to the first end of said body;

c. a second attaching tape secured to the second end of said body;

d. securing means attached to at least one of said attaching tapes, said attaching tapes adapted to releasably secure said tracheotomy or endotracheal tube holder via said slots in position on said patient; and

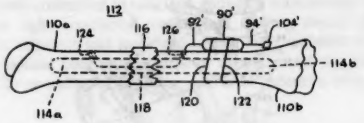
e. said elastic body further comprising an outer covering of stretch knit fabric, an elastic filler encased in said stretch knit fabric, and an expandable stitch securing an edge of said stretch knit fabric.

**4,313,438**

## TISSUE GROWTH CONTROL APPARATUS AND METHOD

**Wilson Greatbatch, 5220 Donnington Rd., Clarence, N.Y. 14031**

**Division of Ser. No. 57,744, Jul. 16, 1979. This application Jul. 14, 1980, Ser. No. 167,752**
**Int. Cl.³ A61N *1/30***
**U.S. Cl. 128—207.21** **8 Claims**



1. Apparatus for providing germicidal and healing treatment of tissue such as bone comprising:

(a) an electrode of silver adapted to be operatively connected to a living tissue site to be healed;

(b) an electrode of platinum adapted to be connected to a location spaced from the site to be healed;

(c) means for establishing an electrical current flow path between said electrodes; and

(d) means operatively associated with said platinum electrode for forming a galvanic couple with said silver electrode to cause electrical current flow in one direction through said silver electrode in a manner releasing silver ions to create a germicidal environment at said tissue site, said galvanic couple forming means after a predetermined time causing said platinum electrode and said silver electrode to form a biogalvanic couple with fluid in the body containing said tissue site to cause electrical current flow in the opposite direction through said silver electrode in a manner promoting healing of tissue at the site.

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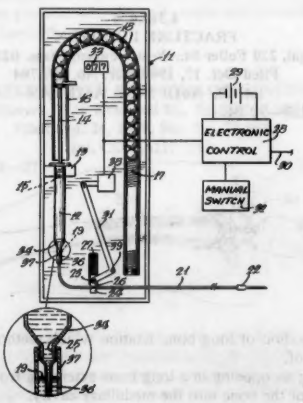
**4,313,439**

## AUTOMATED, SPRING-POWERED MEDICAMENT INFUSION SYSTEM

**Albert L. Babb, Seattle, and Richard E. Parks, Bellevue, both of Wash., assignors to Biotek, Inc., Arlington Heights, Ill.**

**Filed Mar. 24, 1980, Ser. No. 133,320**
**Int. Cl.³ A61M *5/00***
**U.S. Cl. 128—214 F** **25 Claims**




1. Apparatus for the transcutaneous infusion of a liquid medicament into a patient in controlled doses over an extended period, comprising a syringe including a plunger, and defining a cylindrical reservoir for said medicament and a discharge

aperture; a conduit from said aperture to a subcutaneous site in said patient; means for generating a continuous force, and means for intermittently impelling said liquid medicament from said reservoir through said conduit to said subcutaneous site under the influence of said continuous force;

said means for intermittently impelling said liquid medicament through said conduit to said subcutaneous site including an escapement mechanism for transmitting said continuous force intermittently to said plunger; and

said escapement mechanism including an escape wheel having a plurality of projections in the vicinity of its circumference and an anchor capable of oscillation about an axis and having two ends with a pallet at each end thereof, said pallets being disposed in such a manner that each pallet alternately engages and releases each projection with each oscillation of said anchor and permits said escape wheel to rotate intermittently by the circumferential distance between adjacent projections; and

said apparatus including means to transmit said continuous force alternately to said escape wheel and to said plunger during each intermittent rotation of said escape wheel.

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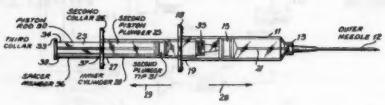
## 4,313,440
## MULTIPURPOSE DOUBLE BARREL SYRINGE AND METHOD OF MANUFACTURE OF SAME

**Sheldon J. Ashley, 147-15 84th Rd., Jamaica, N.Y. 11435**

**Filed Sep. 8, 1980, Ser. No. 190,620**
**Int. Cl.³ A61M *5/00***
**U.S. Cl. 128—218 R** **14 Claims**



7. A multipurpose double barrel syringe, comprising

a first cylinder having a first predetermined capacity and a first hypodermic needle of a first gauge at a first end thereof, said first cylinder having a first collar extending substantially radially therefrom at a second end thereof spaced from and opposite said first end thereof;

a second cylinder having a second predetermined capacity less than the first predetermined capacity, said second cylinder having a second collar extending substantially radially therefrom at a first end thereof and being slidably mounted in said first cylinder for movement in axial directions;

a second piston plunger having a piston rod and a second plunger tip coaxially mounted at a first end thereof coaxially slidably mounted in said second cylinder for movement in axial directions, said piston rod having a third collar extending substantially radially therefrom at a second end thereof spaced from and opposite said first end thereof;

a first plunger tip coaxially mounted on a second end of said second cylinder spaced from and opposite said first end thereof and coaxially slidably movable with said second cylinder in said first cylinder in axial directions;

a second needle of a second gauge extending coaxially through the axial center of said first plunger tip and affixed to said first plunger tip whereby said second cylinder, said second plunger tip and said second needle provide a second syringe assembly functioning as a second syringe and, with said first plunger tip, functions as a piston plunger assembly of said first cylinder, said first cylinder, said first hypodermic needle and said first piston plunger assembly providing a first syringe assembly; and

a spacer member extending between said second and third collars for preventing said second piston plunger from moving into said second cylinder except under manual pressure.

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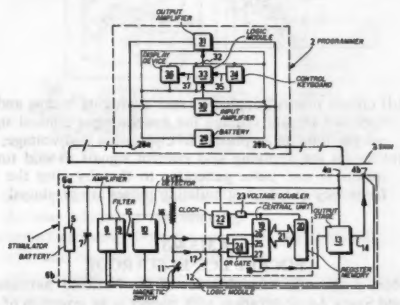
## 4,313,441
## METHOD OF ADJUSTING AN IMPLANTABLE CARDIAC STIMULATOR, AND ADJUSTMENT PROGRAMMER AND STIMULATOR FOR CARRYING OUT SAME

**Jacques Buffet, Le Raincy, France, assignor to Cardiofrance - Compagnie Francaise d'Electrocardiologie, France**

**Filed Apr. 17, 1979, Ser. No. 30,816**
**Claims priority, application France, May 5, 1978, 78 13332**
**Int. Cl.³ A61N *1/36***
**U.S. Cl. 128—419 PG** **8 Claims**



1. Process of regulating by extra-corporeal means an implanted cardiac stimulator comprising means for generating pulses for stimulating the heart of a patient and a pair of electrodes by which said stimulative pulses are transmitted to the heart of the patient, said stimulator having a refractory period between successive pulses, said process comprising:

controlling the stimulator to generated pulses at a fixed frequency independent of the normal cardiac rhythm,

detecting by said extra-corpeal means successive pulses emitted by the stimulator,

transmitting after each of selected stimulator pulses detected during the whole period between successive stimulator pulses a train of successive control pulses which is received and detected by the stimulator as binary information "1" and, on the contrary, transmitting no train of successive control pulses during the whole period between other successive stimulator pulses as binary information "0", applying the binary information thus transmitted to the stimulator to regulate the operation of the stimulator, and

thereupon displaying by said extra-corpeal means the pulses emitted by the stimulator to verify that the regulator is effective.

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## 4,313,442
## ATRIAL RATE SENSITIVE CARDIAC PACER APPARATUS

**Mark B. Knudson, Arden Hills, and David C. Amundson, St. Paul, both of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.**

**Filed Jul. 21, 1980, Ser. No. 170,947**
**Int. Cl.³ A61N *1/36***
**U.S. Cl. 128—419 PG** **5 Claims**

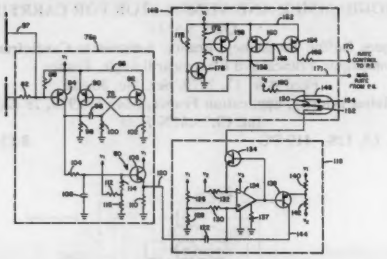
1. Cardiac stimulating apparatus having means for adjusting the frequency of stimulation as a function of physiologic demand, comprising in combination:

(a) a pulse generator having timing means therein for determining the frequency at which cardiac stimulating pulses are produced;

(b) detector means for detecting natural atrial electrical

activity characteristic of physiologic demand and producing trigger signals in response to said natural atrial electrical activity;

(c) averaging means coupled to receive said trigger signals for developing a voltage related to the rate of occurrence of said trigger signals during predetermined time intervals;



(d) circuit means coupled to said averaging means and responsive to said voltage for generating a control signal proportional in amplitude to changes in said voltage; and

(e) means for applying said control signals to said timing means in said pulse generator to thereby alter the said frequency at which stimulating pulses are produced.

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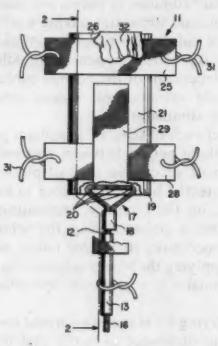
**4,313,443**

## POCKET ECG ELECTRODE

**Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Gordon F. Lund, San Jose, Calif.**

**Filed Sep. 11, 1980, Ser. No. 185,865**
**Int. Cl.³ A61B 5/04**
**U.S. Cl. 128—642** **7 Claims**



1. In a subcutaneous electrode apparatus for measuring electrocardiograms:

an electrically conductive pocket-shaped member having an opening and a lumen, said member being adapted to be chronically subcutaneously implanted in the tissue and body fluid of a subject in which electrocardiograms are to be sensed;

said opening being an elongated mouth adapted to permit body fluids to enter said lumen and contact the inner surface of said member;

electrical conductor means including an electrically conductive wire structure for making electrical connection to said pocket-shaped member;

means bonded to said pocket-shaped member for receiving sutures when said electrode apparatus is implanted in tissue; and

electrically insulative means for coating the outer surface and mouth region of said pocket-shaped member whereby when the electrode apparatus is implanted the body fluid acts as an electrolyte and the electrode/electrolyte interface is situated within the lumen remote from possible tissue disturbances.

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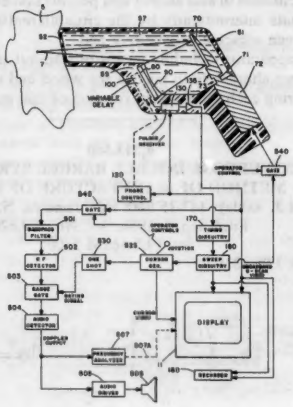
**4,313,444**

## METHOD AND APPARATUS FOR ULTRASONIC DOPPLER DETECTION

**William E. Glenn, Fort Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.**

**Filed May 14, 1979, Ser. No. 38,661**
**Int. Cl.³ A61B 5/02**
**U.S. Cl. 128—663** **31 Claims**



1. A method of determining the velocity of a material moving within a body, comprising the steps of:

directing, over a given aperture, a single focused beam of ultrasound energy toward the skin of said body with the central ray of said beam oriented substantially normal to the skin;

receiving, over the same aperture, the ultrasound beam reflected from said body;

detecting, in the received beam, beat frequency signals resulting from the beating of Doppler effect components reflected from said moving material; and

generating velocity-representative indications as a function of the detected beat frequency signals.

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**4,313,445**

## ELECTRONIC SPHYGMOMANOMETER

**Heinz W. Georgi, Del Mar, Calif., assignor to IVAC Corporation, San Diego, Calif.**

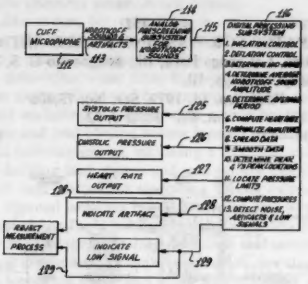
**Filed Oct. 25, 1977, Ser. No. 845,081**
**Int. Cl.³ A61B 5/02**
**U.S. Cl. 128—680** **99 Claims**

1. In an electronic sphygmomanometer, the combination comprising:

means for providing detected korotkoff sounds and associated korotkoff sound precursors as electrical signals, each of said korotkoff sound precursors being included in the waveforms relating solely to the individual korotkoff sound signal with which that precursor is associated; and

means for analyzing the waveforms of all said electrical signals to determine selectively the presence of specified korotkoff sound precursors and the conformity of such precursors with predetermined waveform characteristics,

whereby those electrical signals having waveforms representative of true korotkoff sounds are separated from




those electrical signals which do not represent true korotkoff sounds.

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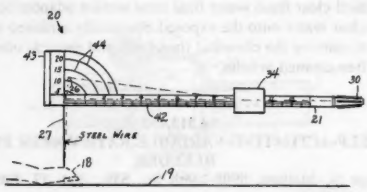
**4,313,446**

## STEEL WIRE PRESSURE AESTHESIOMETER

**Frank N. Kanatani, Baton Rouge, La., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.**

**Filed Mar. 11, 1980, Ser. No. 129,982**
**Int. Cl.³ A61B 5/10**
**U.S. Cl. 128—744** **16 Claims**




1. An aesthesiometer comprising an elongated substantially rigid support member, a resilient wire member on said support member and extending therealong, means securing one end portion of said wire member to said support member so as to bias the wire member toward the support member, said wire member being formed with a bend at its free end portion to define a depending skin probe arm engageable with a skin area of a patient and to cause a deflection of the bend away from the support member responsive to force applied to the support member with the probe arm in contact with such skin area, means to measure the amount of such deflection, and abutment means adjustably mounted on the support member formed to overlie and abut said wire member at selected locations along its length so as to provide an adjustable fulcrum to vary the effective flexural length of the wire member.

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**4,313,447**

## COLLECTION BAG

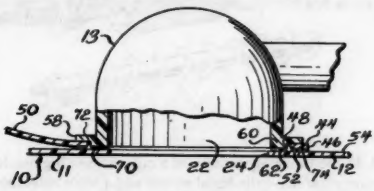
**James J. Peterson, Elgin, and Glenn N. Taylor, Cary, both of Ill., assignors to The Kendall Company, Boston, Mass.**

**Continuation-in-part of Ser. No. 4,972, Jan. 22, 1979, abandoned, which is a continuation of Ser. No. 791,658, Apr. 28, 1977, abandoned. This application Apr. 4, 1980, Ser. No. 137,225**
**Int. Cl.³ A61F 5/44**
**U.S. Cl. 128—766** **4 Claims**

1. A collection bag for receiving and collecting body fluids, comprising:

a receptacle having a pair of opposed walls defining a chamber, with only one of said walls having an opening communicating with the chamber;

a connector having a cavity to receive the body fluids, a base extending peripherally around the opening and having a lower portion being bonded to an outer surface of the one wall peripherally around said opening, said lower portion of the base being fixedly bonded to the one wall with sufficient strength to prevent reattachment to the one wall after being ruptured therefrom, with the connector cavity communicating with the receptacle chamber to permit passage of fluids from the connector into the chamber for collection therein, and an annular recess around said




lower portion facing said wall at an outer side portion of the base relative to said opening;

a conduit extending from the connector and communicating with said connector cavity; and

a rupture member having a ring extending peripherally around the connector and being received in the connector recess with said lower portion being located inside the ring, and a tab extending outwardly from the ring relative to the opening, such that the rupture member may be used to rupture the connector lower portion from said one wall only once after use of the bag without breakage of the ring to permit access to the collected fluid through said opening.

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**4,313,448**

## MYOCARDIAL SUTURELESS LEAD

**Kenneth B. Stokes, Brooklyn Park, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.**

**Filed Jan. 28, 1980, Ser. No. 115,966**
**Int. Cl.³ A61N 1/04**
**U.S. Cl. 128—785** **9 Claims**

1. A body implantable lead comprising:

a conductor having a distal end;

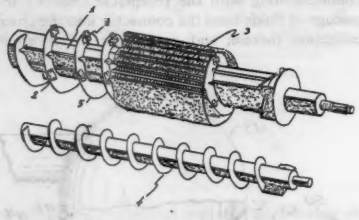
an insulating sheath covering said conductor; means attached to said conductor near said distal end for affixing said body implantable lead to body tissue; and

flexible base means attached to said conductor near said distal end which in a relaxed state is disposed over said fixation means from at least one direction and which upon application of a small amount of force may be bent back exposing said fixation means from said at least one direction.

## 4,313,449
## ROTOR OF THRASHING SECTION OF CROP HARVESTING MACHINE

Jose T. Da Silva, Ribeirao Preto, Brazil, assignor to Cia Penna de Maquinas Agricolas-COPEMAG, Brazil

Filed Apr. 24, 1980, Ser. No. 143,175
Claims priority, application Brazil, Apr. 25, 1979, 5900551[U]
Int. Cl.³ A01F *12/18*
U.S. Cl. 130—27 T 2 Claims

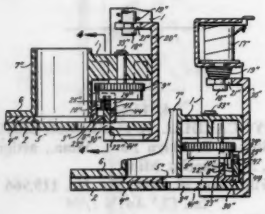


1. In the thrashing section of a crop harvesting machine, the combination of a cylindrical screen and a rotor rotatable in said cylindrical screen, said rotor comprising a cylindrical body, an outwardly projecting vane extending helically around said body and fixed thereto, and a plurality of pins mounted at the periphery of said vane and projecting outwardly of said vane, said pins being L-shaped and adjustable to different positions according to the requirements for the crop being harvested.

## 4,313,450
## COIN-DISPENSING DEVICE

Noriaki Kirisawa, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Dec. 21, 1979, Ser. No. 106,270
Int. Cl.³ G07D *1/00*
U.S. Cl. 133—5 R 15 Claims

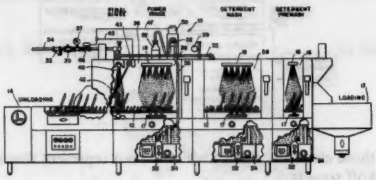


15. A coin-handling device which comprises a plurality of coin reservoirs, a plurality of coin-dispensing slides that are disposed so each of said coin-dispensing slides is adjacent a coin reservoir and is movable relative to said adjacent coin reservoir to dispense a coin from said adjacent coin reservoir, an electric motor, a plurality of slide-moving gears which are disposed adjacent to said coin reservoirs and to said coin-dispensing slides therefor and which are disposed so each of said coin-dispensing slides has a slide-moving gear adjacent to it, said electric motor constituting a driving element for said coin-dispensing slides, and means to selectively interconnect one of said slide-moving gears with the coin-dispensing slide therefor to enable said one slide-moving gear to drive said coin-dispensing slide when said one slide-moving gear moves by providing relative movement of a portion of said one slide-moving gear and a portion of said one coin-dispensing slide toward each other, said portion of said one slide-moving gear serving as an abutment, said portion of said one coin-dispensing slide also serving as an abutment, said abutments being directly engageable to cause rotation of said one slide-moving gear to drive said one coin-dispensing slide.

## 4,313,451
## APPARATUS FOR WASHING SOILED ARTICLES

Erik O. Vilen, LaGrange Park, Ill., assignor to G. S. Blakeslee & Company, Chicago, Ill.

Filed Sep. 14, 1979, Ser. No. 75,406
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—47 10 Claims



1. An apparatus for washing soiled articles and having a conveyer means movable therethrough, including in combination;

a first detergent wash section adapted to direct a detergent wash solution onto the exposed articles positioned on the conveyor means to wash the same;

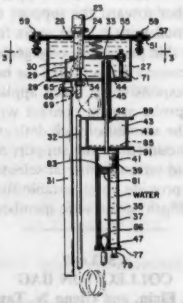
a second chemical sanitizing power rinse section adapted to direct a chemical sanitizing solution onto the exposed washed articles positioned on the conveyor means to chemically sanitize the same, and

a third clear fresh water final rinse section adapted to direct clear water onto the exposed chemically sanitized articles to remove the chemical therefrom and provide chemical-free cleaned articles.

## 4,313,452
## SELF-ACTUATING VARIABLE RATE WATER PIPE BLEEDER

George K. Mellard, 8905-238th St., SW., Apt. 17, Edmonds, Wash. 98020

Filed Aug. 25, 1980, Ser. No. 180,983
Int. Cl.³ E03B *7/12*
U.S. Cl. 137—62 7 Claims




1. An apparatus for preventing the water in a water supply pipe upstream of the apparatus from freezing, comprising:

sample chamber means filled with water and exposed to the environment, the water in said sample chamber means freezing when the environmental temperature goes below freezing;

drain means for receiving water from the water supply pipe

in one portion thereof and for discharging it to the environment from another portion thereof;

means closing off said drain means when the water in said sample chamber means is not frozen;

piston-like means for operating on said closing means to open said drain means in response to the water in said sample chamber means freezing;

means delivering water from the water supply pipe to said drain means when said drain means is open, said delivery means including a holding tank means having said drain means and said closing means located therein;

thermal isolating means, including a first heat sink, between said holding tank means and said sample chamber means;

wherein said piston-like operating means extends through said thermal isolating means, between said sample chamber means and said holding tank, wherein in operation the lower end of the piston moves within said sample chamber means in response to the water therein freezing, which in turn forces the upper end of the piston against said closing means, thereby opening said drain means, wherein a flow of water through the water supply pipe and out said drain means to the environment is maintained as long as the water in said sample chamber means is frozen, such a water flow tending to prevent water in the water supply pipe upstream of the apparatus from freezing.

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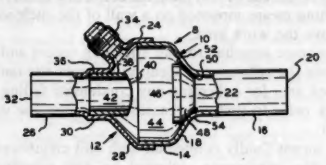
## 4,313,453
## THERMALLY OPERATED VALVE

**Paul M. Holmes, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.**

**Filed Oct. 30, 1979, Ser. No. 89,515**
**Int. Cl.³ F16K *13/04***
**U.S. Cl. 137—74** **4 Claims**




1. A thermally operated valve for closed conduit systems comprising, in combination, a hollow metal body forming a chamber having inlet and outlet ports defined therein, said body being formed of sheet metal and including two interconnected parts each having an enlarged portion and an elongated tubular stem, said enlarged portions telescoping upon each other and sealingly interconnected, the intersection of said stems with the associated enlarged portion constituting a port, a plug within said chamber extending across at least one of said ports sealing said one port, and a fusible bonding material affixing said plug to said body across said one port whereby heat externally applied to said body melts said bonding material permitting said plug to to fall within said chamber and unseal said one port.

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## 4,313,454
## HYDRAULIC BRAKE BOOSTER PRESSURE LIMITER

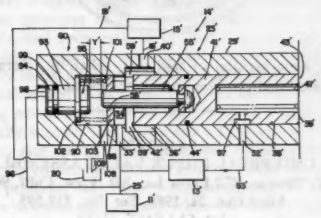
**Kenneth D. Jensen, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio**

**Filed Dec. 12, 1979, Ser. No. 102,884**
**Int. Cl.³ G05D *11/02*; B60T *13/12***
**U.S. Cl. 137—101** **21 Claims**

1. A pressure limiter for a hydraulic booster, comprising:

(a) a housing having, (I) a front end in opposed relation to a closed back end, (II) a first chamber adjacent the front end and extending longitudinally of the housing therefrom towards the closed back end, the first chamber having a fluid inlet through which fluid enters the first chamber, (III) a second chamber communicating with the first chamber in coaxial alignment and extending therefrom in the direction of the closed back end of the housing and having a greater cross-sectional area than that of the first chamber, the second chamber having a fluid outlet through which fluid exits the second chamber, and (IV) a gain valve bore communicating with the second chamber in coaxial alignment and extending therefrom in the direction of the closed back end of the housing;

(b) a gain valve piston slideably mounted in the gain valve bore and extending into the second chamber and being reciprocable in the bore and second chamber, the piston capable of sealing the first chamber from the second chamber to block the flow of fluid between the fluid inlet and the fluid outlet, as the piston approaches and abuts the first chamber;



(c) a second fluid inlet in the housing in communication with the gain valve bore and through which fluid, under pressure, enters the housing and engages and moves the gain valve piston towards the front end of the housing to seal the first chamber from the second chamber;

(d) means for biassing the gain valve piston in the direction of the first chamber; and

(e) means, operable by fluid under pressure, for engaging the gain valve piston and preventing the gain valve piston from abuting and sealing the first chamber to block the flow of fluid between the fluid inlet and outlet, said gain valve piston engaging means including, (I) a separate pressure limiter piston reciprocable in a bore that is separate from the bore of the gain valve piston from sealing the first chamber from the second chamber, and (II) means for biassing the pressure limiter piston in the direction of the front end of the housing.

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## 4,313,455
## FLUID ROUTING DEVICE

**Donald G. Pitman, Glendale, Ariz., assignor to Lester R. Mathews, Phoenix, Ariz.**

**Filed Nov. 14, 1979, Ser. No. 94,393**
**Int. Cl.³ F16K *11/14***
**U.S. Cl. 137—119** **6 Claims**

1. In a fluid routing device including:

a. a hollow body including at least two exterior parts comprising upper and lower segments joined together to make a self-contained, unitary body, and having

(1) inlet means for the admission of fluid;

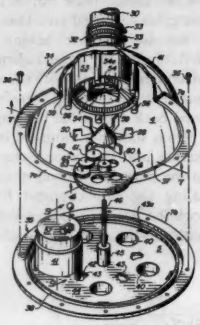
(2) a plurality of valve means having open and closed positions relative the outward passage of fluid;

(3) means responsive to the flow of fluid for sequentially opening and closing said valves;

b. a base plate adapted to attachment to said lower segment and having a plurality of outlet means registering with and controlled by said valve means; and

c. means for releasably attaching said body to said base plate, each of said plurality of valve means comprising a casing, a diaphragm disposed within said casing, a valve plug suspended within said casing by means of said diaphragm,

a port in said lower segment having a valve seat, said plug having a valve face sized and adapted to register with and



seal on a portion of said seat, whereby tolerance is increased and positive seating enhanced.

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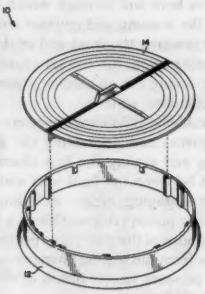
**4,313,456**

**UNIVERSAL CHECK VALVE ASSEMBLY**

**Mark W. Thomas, 472 Lotus La., Mt. View, Calif. 94043**

**Filed Dec. 24, 1980, Ser. No. 219,595**
**Int. Cl.³ F16K *15/14***
**U.S. Cl. 137—269** **9 Claims**



1. A universal check valve adapted for retrofit within a tubular conduit comprising:

an adjustable diameter support hoop formed from an elongated strip provided with a plurality of sockets formed along an inner surface thereof, said strip further being provided with a plurality of a firstly configured interlocks formed along said inner surface, said strip further being provided with a secondly configured interlock formed along said inner surface, said secondly configured interlock being removably engagable with said firstly configured interlocks, said elongated strip being further provided with a downwardly extending, outwardly flaring skirt;

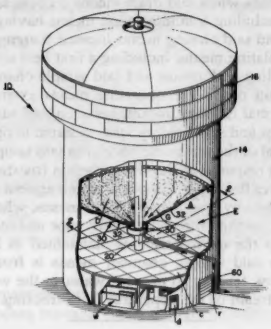
a circular valve structure of adjustable diameter including a diametrical spine, a first semi-circular valve flap hingedly attached to one side of said spine, a second semi-circular flap hingedly attached to an opposing side of said spine, said valve structure being provided with at least one concentrically formed score line on an upper surface of said valve flaps, said valve further being provided with a plurality of projections downwardly extending from said spine, said projections being engagable with a diametrically opposed pair of said sockets.

**4,313,457**

**REMOVABLE CONDENSATE COLLECTOR FOR ELEVATED WATER STORAGE FACILITIES**

**John O. Cliff, Franklin, Tenn., assignor to Pittsburgh-Des Moines Corporation, Pittsburgh, Pa.**

**Filed Nov. 20, 1979, Ser. No. 95,959**
**Int. Cl.³ E03B *11/00, 9/00***
**U.S. Cl. 137—312** **9 Claims**



9. An improvement in an elevated water storage facility including a water storage tank supported on top of an enclosed column, the column being divided into an air space and a work area for offices, warehouses, and the like with elements located in the work area which can be damaged by condensate falling thereonto from the tank, the improvement comprising collecting means for collecting condensed water vapor which drips from the underside of said tank, the collecting means including:

attaching means mounted on a wall of the enclosed column above the work area;

a membrane attached to said attaching means and mounted inside the column at a location between the tank and the work area for collecting any condensate falling from the tank prior to that condensate falling into the work area; and

drain means fluidly connected with said membrane for conducting condensate collected by said membrane away from said membrane.

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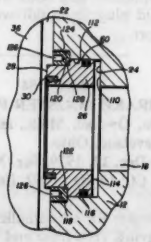
**4,313,458**

**RESTRICTED MOVEMENT VALVE SEATS FOR AN EXPANDING GATE VALVE**

**Ivan A. Burns, and William R. Hochmuth, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.**

**Division of Ser. No. 95,911, Nov. 19, 1979, Pat. No. 4,246,928.**
**This application Nov. 21, 1980, Ser. No. 209,180**
**Int. Cl.³ F16K *43/00***
**U.S. Cl. 137—327** **2 Claims**



1. In an expanding valve structure having a valve body presenting a valve chamber and a fluid flow passageway, an

expandable valve member mounted in the valve chamber for movement in a collapsed condition between open and closed positions, and means for expanding the valve member to an expanded condition in both the open and closed positions, the improvement comprising:

a pair of spaced apart seat pockets formed about the flow passageway adjacent the valve chamber and on opposite sides thereof, each said seat pocket opening to the valve chamber and having a bottom surface disposed generally transverse to the passageway and extending substantially radially therefrom and a cylindrical outer surface substantially coaxial with said passageway, said cylindrical outer surface presenting an annular recess therein at a location spaced from said bottom surface and encompassing the flow passage, said annular recess opening to the valve chamber and having a bottom wall residing in a plane substantially radial to the flow passageway and a threaded circumferential surface which is coaxial with said passageway extending from said bottom wall to the valve chamber;

a pair of annular valve seats mounted in said seat pockets in a manner permitting limited inward and outward movement of said seats toward and away from one another, each seat having a base surface adjacent the bottom surface of the pocket and an inner sealing surface for sealing against the valve member in the open and closed positions thereof, each seat also having a cylindrical outer surface adjacent said outer surface of the corresponding seat pocket and a shoulder between said base and sealing surfaces facing toward said valve member, said shoulder being provided by a reduced external diameter portion of said valve seat;

a seat retaining ring mounted in each said recess, each said seat retaining ring having an external diameter corresponding to the diameter of the circumferential surface of each said recess and being externally threaded for cooperative threaded engagement with the threaded surface of the recess, said seat retaining ring having an internal diameter which is less than that of the unrecessed portion of the cylindrical outer surface of its associated seat pocket whereby said seat retaining ring projects out of the recess into the seat pocket inwardly of said cylindrical outer surface, said shoulders of the seats being adapted to engage the retaining rings to limit movement of the seats in the direction towards the valve member to positions wherein said sealing surfaces of the seats are spaced outwardly of the valve member in the collapsed condition thereof.

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**4,313,459**

## AUTOMATIC FILL-STOP VALVE

**Gerald D. Mylander, 1232 W. Collins, Orange, Calif. 92667**

**Filed Jan. 12, 1979, Ser. No. 2,954**

**Int. Cl.³ F16K** *21/18, 33/00*

**U.S. Cl. 137—416** **11 Claims**

3. A float valve for controlling liquid inflow into a tank to stop inflow when the liquid level in the tank reaches a desired level, the tank also has a manual valve in series with the float valve for manual control of the inflow, said float valve comprising:

a body arranged to be secured to attachment means in the tank so that the body is oriented in an upright position in the tank, a bore in said body, said bore being for connection to receive all liquid inflow into the tank, a channel laterally extending out of said body from said bore so that liquid flowing into the tank flows out of said channel;

a tubular sleeve positioned around said body and slidably mounted for movement along said body from a lowered position where said channel is uncovered to a raised position where said channel is covered by said sleeve and where the sleeve is in sealing relationship to the float valve body attachment means, said sleeve having an upwardly facing area subject to tank pressure and an equal downwardly facing area subject to channel pressure when said sleeve is in the raised position where said channel is covered by said sleeve so that during filling when channel pressure is higher than tank pressure, a net force is applied by the pressures to the sleeve to urge said sleeve upwardly, and upon outflow of fluid from said bore lower than tank pressure in said channel is applied to the downwardly facing area to thrust said sleeve down to open said channel to permit fluid outflow from the tank; and

a spring positioned between said sleeve and said body to partially support said sleeve and a float mounted on said sleeve, said spring being positioned to urge said sleeve from the channel uncovered position to the channel covered position, said float being positioned to raise said sleeve to cover said channel when the desired liquid level is reached in said tank so that said valve is float-triggered and pressure-operated and said spring partially counterbalances the weight of said float.

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**4,313,460**

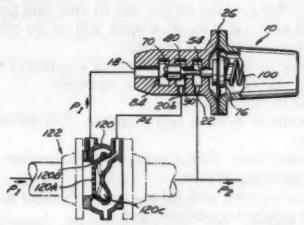
## PILOT VALVE

**Dwight N. Johnson, El Toro, Calif., assignor to JH Industries, Inc., San Marcos, Calif.**

**Filed Oct. 4, 1979, Ser. No. 81,845**

**Int. Cl.³ G05D** *16/00;* **F16K** *31/365*

**U.S. Cl. 137—489** **16 Claims**



1. A pressure reducing pilot valve for controlling a main valve of the type having an upstream flow port, a downstream flow port and a control port, said pilot valve comprising:

a housing defining a downstream pressure region adapted to communicate with the main valve downstream flow port, an upstream pressure region adapted to communicate with the main valve upstream flow port, and a loading pressure region disposed between said downstream and upstream pressure regions and adapted to communicate with the main valve control port;

a valve seat separating said downstream pressure region and said loading pressure region;

pressure responsive means in said housing adapted to communicate with the main valve downstream flow port and including a member movable in response to downstream pressure variations;

a poppet connected to said movable member;

valve means on said poppet including a tapered valve sur-

face movable with respect to said valve seat to control flow between said loading pressure region and said downstream pressure region;

the larger portion of said tapered valve surface being disposed in said loading pressure region and the smaller portion of said tapered valve surface being disposed in said downstream pressure region;

said valve means also including means separating said upstream pressure region and said loading pressure region, said separating means including a pressure responsive surface of substantially constant effective area exposed to upstream pressure in said upstream pressure region; and

a restricted flow passage between said upstream pressure region and said loading pressure region.

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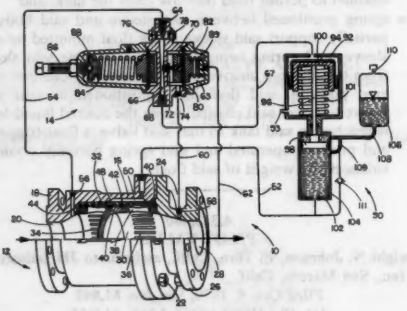
**4,313,461**

## PILOT PRESSURE INTENSIFIER

**Richard S. Brumm, Orinda, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.**

**Filed Jul. 25, 1980, Ser. No. 172,403**
**Int. Cl.³ F16K *31/38***
**U.S. Cl. 137—489** **4 Claims**



1. For use with a main valve member, including a flexible control member exposed on one side to upstream line pressure biasing said main valve member open, and on the other side by fluid pressure in a control chamber;

a load line to said control chamber connected to the upstream side of said main valve member;

an orifice in said load line;

a pilot exhaust port in said load line downstream of said orifice;

a pilot valve body with a valve closure member engagable with said exhaust port;

means for opening said valve closure member at predetermined pipeline conditions; and

an exhaust duct for connecting said exhaust port to the downstream side of said main valve member;

the improvement comprising:

a pressure intensifier interposed in said load line downstream of said exhaust port and including:

first and second vessels connected to the outlet of said load line and to said main valve control chamber, respectively;

said first vessel being larger in cross-section than said second vessel;

first and second pressure responsive members sealed across said first and second vessels;

a liquid contained in said second vessel on the delivery side of said second pressure-responsive member;

said pressure-responsive members being mechanically connected so that a pressure applied to said first pressure-responsive member to produce movement thereof moves said second pressure-responsive member to deliver liquid at intensified pressure to said jacket;

a reservoir open to atmosphere and containing said liquid;

a liquid supply line from said reservoir to said second vessel away from the delivery end thereof to be uncovered by said second pressure-responsive member when retracted; and

biasing means in said first vessel acting against said first pressure-responsive member in opposition to fluid pressure so that only atmospheric pressure is delivered by said second pressure-responsive member until said biasing means is overcome to cover said liquid supply line, and thereafter pressure in excess of said biasing means is multiplied in accordance with the ratio of vessel cross-sectional areas.

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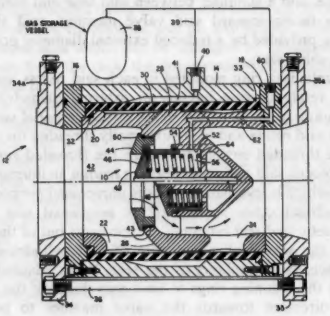
**4,313,462**

## SEQUENTIALLY OPERATED VALVE STRUCTURE

**Kenneth S. Adamson, Walnut Creek, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.**

**Filed Oct. 10, 1980, Ser. No. 195,948**
**Int. Cl.³ F16K *15/00***
**U.S. Cl. 137—512.1** **6 Claims**



1. In a flexible tube valve comprising:

a housing with coaxially aligned inlet and outlet flow passages;

a generally cylindrical, tubular cage in said housing coaxial with said flow passages and having spaced rows of inlet and outlet slots around it;

a cylindrical barrier across said cage intermediate said rows of slots;

a flexible tube stretched over said cage and sealed at opposite ends to said housing;

a space in said housing forming a jacket around said flexible tube; and

a port in said housing for introducing a control pressure into said jacket.

the improvement comprising:

an inlet flow passage extension through said barrier;

a valve seat around said flow passage;

a poppet valve slidable on said barrier and engagable with said valve seat;

portions on said poppet valve being exposed to upstream fluid pressure to be biased thereby toward open, retracted position;

a sealed chamber in said barrier behind said poppet valve; and

duct means connecting said chamber with a source of pressurized fluid.

4,313,463

## PRESSURE-RELIEF VALVE DEVICE

Walter Weirich, Dortmund, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhütte Westfalia, Lünen, Fed. Rep. of Germany

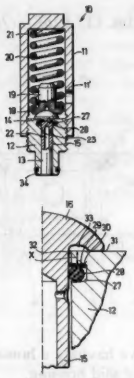
Filed Mar. 21, 1980, Ser. No. 133,483

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1979, 2914981

The portion of the term of this patent subsequent to Aug. 18, 1998, has been disclaimed.

Int. Cl.³ F16K *15/06*

U.S. Cl. 137—538 11 Claims



1. A valve device for pressure-relief of hydraulic pressure fluid, and especially for pressure-relief of hydraulic props of mine equipment; said valve device comprising a main housing, a guide located in the main housing, the guide having a bore therein, a valve member received in the bore of the guide, an axial bore in the valve member which communicates via a multiplicity of radial borings with pressure fluid outlets at an external peripheral surface of the valve member, a groove in the wall of the bore of the guide, a sealing ring located in said groove to engage in sealing relationship with the peripheral surface of the valve member thereby, to establish a seal, the valve member being displaceable along the bore of the guide to bring the fluid outlets into axially spaced positions on one or other side of the seal, a head on the valve member, a spring located in the main housing to apply force to bias the valve member to a position with its fluid outlets at said one side of the seal and with its head engaging on an end face of the guide on the said other side of the seal, a resilient thrust ring located in said groove to contact both the sealing ring and a flank wall of the groove adjacent the said other side of the seal, said flank wall being spaced from the end face of the guide by a distance less than the axial width of the groove, with the external diameter of the head of the valve member being greater than the root diameter of the groove so that the engagement between the head of the valve member and the end face of the guide under the force of the spring extends radially outwardly beyond the groove, a main inlet for pressure fluid leading to the axial bore and radial borings and outlets of the valve member and a main outlet for pressure fluid leading to the other side of the seal, whereby the spring force holds the valve member in a position with its outlets on the said one side of the seal to isolate the main outlet from the main inlet and the valve member can be displaced by excess fluid pressure against the restoring force of the spring to bring its outlets to the said other side of the seal to permit flow of the pressure fluid from the main inlet to the main outlet with consequential pressure-relief.

4,313,464

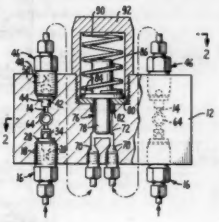
## FLUID CONTROL APPARATUS

Emery Major, 17 Skylark Dr. #1, Larkspur, Calif. 94939

Filed Nov. 6, 1979, Ser. No. 91,726

Int. Cl.³ F04B *11/00*

U.S. Cl. 137—544 9 Claims



1. Fluid control apparatus comprising in combination:

mounting means;

at least one inlet check valve assembly mounted on said mounting means in fluid flow communication with said inlet check valve assembly, each of said check valve assemblies including a movable valve member and a valve seat cooperable to permit passage of fluid therethrough in a predetermined direction;

filter means operatively associated with each of said check valve assemblies for removing particulate matter from liquid passing through said check valve assemblies; and

a pulse damper device comprising a primary housing interior defined by said mounting means in fluid flow communication with said outlet check valve assembly and a dispenser orifice formed in said mounting means, a piston including a ram portion slidably positioned in said primary housing interior and responsive to fluid pressure in said primary housing interior to move away from said dispenser orifice, a coil compression spring continuously urging said piston toward said dispenser orifice, and a spring housing mounted on said mounting means for accomodating said coil compression spring and having a bearing surface maintaining said spring in compression against an element of said piston, seal means disposed between said primary housing and said spring housing and having an aperture within which said piston ram portion is slidably disposed, said seal means maintaining the housing interior, the coil compression spring and the piston element out of contact with said fluid.

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4,313,465

## METHOD AND CONTROL DEVICE FOR DOSING FLOW MEDIA

Heinz Holzem, Mönchengladbach, and Helmut Kehrmann, Kaarst, both of Fed. Rep. of Germany, assignors to Pierburg Luftfahrtgeräte Union GmbH, Fed. Rep. of Germany

Filed Nov. 9, 1978, Ser. No. 959,196

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1977, 2751743

Int. Cl.³ F16K *31/02*

U.S. Cl. 137—599 14 Claims

1. A flow control system for the control of a plurality of parallel-connected on/off valves comprising:

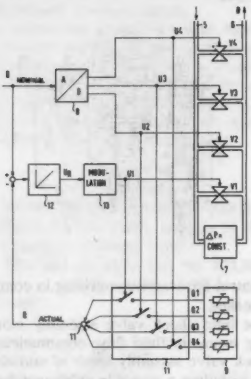
a plurality of base control on/off valves connected in parallel between the input and output lines of a flowing medium, said valves subject to on/off control by an electrical signal;

means for providing control signals for controlling said base control valves, said means responsive to a nominal input control signal;

a timed valve subject to control by a pulse-width modulated signal, said valve connected parallel to the base control valves between said input and output lines;

means for providing signals which are analogs of the values of flow through each of the valves;

summing means for combining said flow-analogous signals to form a signal representing the actual flow through the output line;



means for comparing the actual flow signal with said nominal input control signal to form an error signal; and

means responsive to said error signal for pulse-width modulating said timed valve.

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**4,313,466**

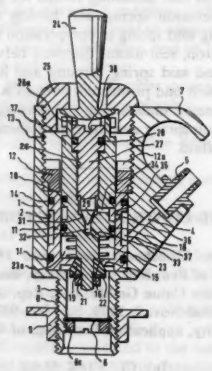
## VALVE FOR DRINKING FOUNTAINS

**John F. Adams, Warley, England, assignor to H. E. Rudge and Company Limited, Birmingham and Associated Builders Merchants Limited, Essex, both of, England**

**Filed Apr. 23, 1980, Ser. No. 143,087**

**Int. Cl.³ F16K *1/04***

**U.S. Cl. 137—614.17** **2 Claims**



**1.** In a valve comprising a valve body having an inlet connection and an outlet leading to and from a valve chamber in the body respectively, a valve seat in the valve chamber facing towards the inlet, and a plunger carrying a tapered valve member of resilient material cooperable with the valve seat: the improvement comprising a hollow valve seat support slidably and sealingly received in the valve chamber and removably secured therein, said valve seat support carrying the valve seat, said plunger being slidably and sealingly mounted in the valve seat support and provided with a flow passage between the valve seat and said outlet, and a restrictor member extending lengthwise of the plunger and adjustably mounted therein for restricting said flow passage, the restrictor member having adjustment means on the end thereof remote from the restricted flow passage and accessible for adjustment of said member while the plunger and valve seat support remain in operating position in the valve chamber.

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**4,313,467**

## CONTROL VALVE

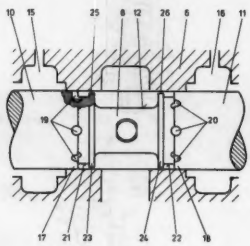
**Armin Lang, Bettringen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany**

**Filed Jan. 22, 1980, Ser. No. 114,388**

**Claims priority, application Fed. Rep. of Germany, Jan. 25, 1979, 2902751**

**Int. Cl.³ F16K *3/24***

**U.S. Cl. 137—625.3** **2 Claims**



**1.** In a control valve havinng a housing and a piston valve reciprocal in a bore of said housing;

said piston valve having at least one collar **(10)** coacting with a housing groove **(15)**; the improvement which comprises a groove **(21)** at an end **(17)** of said collar demarcated by a collar **(25)** of smaller diameter than said the housing bore to effect a flow throttling gap therebetween;

and radial recess means **(19, 20)** arrayed around said collar and extending into said latter groove for permitting flow between said collar end **(17)** and said latter groove **(21)** and therefrom through said throttling gap when said piston valve and said housing groove are relatively positioned to conduct flow;

wherein said radial recess means limits the leakage circumference of said end **(17)** of said collar, and said groove **(21)** at said end of said collar effects smoothing of turbulence and said throttling gap effects a laminar flow downstream of said latter groove, to reduce flow noise.

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**4,313,468**

## SERVO VALVE

**Kishor J. Patel, Hales Corners, Wis., assignor to Dynex/Rivett Inc., Pewaukee, Wis.**

**Continuation of Ser. No. 44,440, Jun. 1, 1979, abandoned, which is a continuation of Ser. No. 815,467, Jul. 12, 1977, abandoned. This application Feb. 8, 1980, Ser. No. 119,700**

**Int. Cl.³ F15B *13/043***

**U.S. Cl. 137—625.61** **1 Claim**

**1.** A fluid flow control servo valve comprising:

a valve housing having a generally cylindrical bore extending therethrough;

a supply port extending into said valve housing for receiving working fluid from an external pump;

a return port extending into said valve housing for returning working fluid from said valve housing to a tank;

an isolated pilot port extending into said valve housing and being separated from said supply port and said return port for receiving pilot pressure; a generally cylindrical valve spool dimensioned to be slidingly received within said valve housing bore, said cylindrical valve spool having

an internal passageway axially extending throughout the length of said valve spool,

an internally enlarged zone at one end of said valve spool forming a first chamber, and

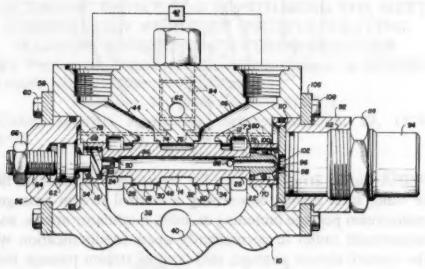
an internally enlarged zone at the other end of said valve spool forming a second chamber;

first fixed orifice means mounted within said internal passageway in said generally cylindrical valve spool generally at said one end of said valve spool and providing fluid communication between said internal passageway and said first chamber;

fixed aperture means coaxially fashioned within said internal passageway in said generally cylindrical valve spool generally at said other end of said valve spool and having internal dimensions greater than the internal dimensions of said first fixed orifice means at said one end of said valve spool and providing fluid communication between said internal passageway and said second chamber;

said valve spool being exteriorly fashioned with first and second cylindrical land areas at opposite ends of said valve spool and third and fourth cylindrical land areas axially spaced intermediate said first and second land areas, each of said cylindrical land areas being dimensioned to intimately contact said valve housing in sliding engagement within said bore of said valve housing, said cylindrical land areas forming

first and second cylindrical end grooves between said first and third and fourth and second cylindrical land areas, respectively, and



a third cylindrical central groove between said third and fourth cylindrical land areas;

first passage means extending through said valve housing and connecting said first and second cylindrical end grooves to said return port such that hydraulic fluid within either of said first or second cylindrical end grooves may be returned to tank;

second passage means extending through said valve housing from said supply port to said third cylindrical central groove for delivering pressurized hydraulic fluid into said cylindrical bore;

third and fourth passage means extending through said valve housing for respectively and selectively communicating said first and second cylindrical end grooves to a load and said third central groove to a load, depending on the position of said valve spool relative to said valve housing;

first and second cylindrical grooves in said valve housing radially projecting outwardly from said cylindrical bore of said valve housing and being located at the axial extremities respectively of said third cylindrical land area on said valve spool;

third and fourth cylindrical grooves in said valve housing radially projecting outwardly from said cylindrical bore of said valve housing and being located at the axial extremities respectively of said fourth cylindrical land area on said valve spool;

said third and fourth cylindrical land areas of said valve spool being axially dimensioned such that a null position may be established wherein the passage of hydraulic fluid from said third cylindrical central groove of said valve spool into said second cylindrical groove radially projecting into said valve housing and from said fourth cylindrical groove radially projecting into said valve housing into said second cylindrical end groove in said valve spool will be blocked while concomitantly the passage of hydraulic fluid from said third cylindrical central groove of said valve spool into said third cylindrical groove radially projecting into said valve housing and from said first cylindrical groove radially projecting into said valve housing into said first cylindrical end groove in said valve spool will be blocked;

aperture means generally radially projecting into said generally cylindrical valve spool for fluidically connecting said internal passageway of said valve spool with said first passage means through said valve housing such that hydraulic fluid within said internal passageway of said valve spool may be returned to tank through said return port in said valve housing;

cap means releasably mounted upon said valve housing and extending into said valve housing in a posture coaxial with respect to said generally cylindrical valve spool and adjacent to said internally enlarged zone at said other end of said valve spool forming a second chamber;

washer means mounted generally transversely across said cap means and adjacent to said second chamber;

first compression spring means mounted within said second chamber and extending coaxially within said valve spool between said washer means and an internal ledge of said second chamber, said first compression spring means being axially dimensioned to normally bias said valve spool away from a mechanical null position of said third and fourth cylindrical land areas of said valve spool with respect to said first, second, third, and fourth cylindrical grooves radially projecting into said valve housing;

end gland means releasably mounted upon said valve housing and extending into said valve housing in a posture generally coaxial with respect to said generally cylindrical valve spool and adjacent to said internally enlarged zone at said one end of said valve spool forming a first chamber;

piston means mounted for translation within said end gland means and coaxially aligned with respect to said generally cylindrical valve spool and extending adjacent to said first chamber;

second compression spring means mounted within said first chamber and extending coaxially within said one end of said valve spool between one side of said piston means and an internal ledge of said first chamber, said second compression spring means being axially dimensioned to normally bias said valve spool in a direction opposing the bias of said first compression spring means; mechanical adjustment means connected to said end gland means and abutting against the other side of said piston means for selectively translating said piston means to mechanically react said second compression spring means against said first compression spring means and mechanically bring said valve spool to a null position within said cylindrical bore of said valve housing such that hydraulic fluid is blocked from flowing from said third central groove of said valve spool to either of said second or third cylindrical grooves radially projecting outwardly from said cylindrical bore of said valve housing and from said first cylindrical groove radially projecting outwardly from said cylindrical bore into said first cylindrical end groove of said valve spool and from said fourth cylindrical groove radially projecting outwardly from said cylindrical bore into said second cylindrical end groove of said valve spool;

fifth passage means extending through said valve housing for fluidically connecting said isolated pilot port to said first chamber formed at said one end of said valve spool;

second fixed orifice means positioned within said fifth passage means and being dimensioned to be equal to said first fixed orifice means mounted within said internal passageway generally at said one end of said valve spool;

sixth passage means extending through said valve housing for fluidically connecting said isolated pilot port to said second chamber formed at said other end of said valve spool;

third fixed orifice means positioned within said sixth passage means and being dimensioned to be equal to said first and second fixed orifice means;

said first and second chambers formed at the ends of said valve spool being operable to receive intermediate control pressure from said isolated pilot port through said fifth passage means and second fixed orifice means and said sixth passage means and said third fixed orifice means, respectively;

electro-magnetic force motor means coaxially mounted within said cap means, said force motor means having

a generally cylindrical force motor stem mounted for selective reciprocation within said force motor means, said force motor stem having an outer, planar end surface operably extending adjacent to but spaced from said fixed aperture means coaxially fashioned at said other end of said valve spool,

said fixed aperture means comprising a nozzle pressed into said internal passageway of said generally cylindrical valve spool at said other end thereof, said nozzle having

a planar annular outer surface disposed opposite to and mutually parallel with said planar end surface of said force motor stem, such that the annular zone between said planar end of said force motor stem and said planar annular surface on said fixed aperture means constitutes fourth orifice means of variable area; and

means connecting said electro-magnetic force motor means to said cap means for axially adjusting said force motor means and said force motor stem such that, in an electromagnetic null position of said force motor means, the area of said fourth orifice means may be operably set to equal the area of said first, second, and third fixed orifice means, such that said valve spool will be fluidically balanced in a null position when said force motor means is in a null position.

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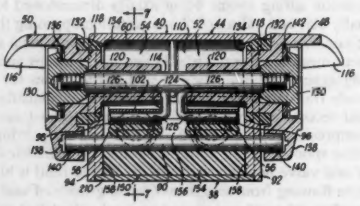
**4,313,469**

## FAUCET ASSEMBLY WITH PINCH VALVES

**Dwight N. Johnson, San Marcos, Calif., assignor to JH Industries, Inc., San Marcos, Calif.**

**Filed May 8, 1980, Ser. No. 147,701**
**Int. Cl.³ F16K *19/00***
**U.S. Cl. 137—637** **26 Claims**



**1.** A faucet assembly for use with a sink and with sources of hot and cold water water remote from the sink deck, said faucet assembly comprising in combination a housing including a base portion; means for mounting the base portion on the sink deck; a spout extending from the base portion and having an outlet adjacent its end; a mixing chamber adjacent to and communicating with said outlet; a recess defined within said spout and extending from said mixing chamber to said base portion; a pair of continuous, elongated, flexible tubular conduits connected to said mixing chamber and extending through said recess to said base portion and extending through said base portion and sink deck for connection to the water supply sources; a cross member extending across said recess adjacent said mixing chamber and engaging one side of said conduits; a shaft extending across said recess; an operating lever rotatably mounted on each end of said shaft, each including a handle portion mounted externally of said spout; a pair of pinch members, one engageable with each conduit opposite said cross member; spring means independently and resiliently forcing said pinch members against said conduits normally to maintain said conduits in a pinched closed position; and a pair of link means, each coupled between one operating lever and one pinch member for withdrawing said pinch member against the spring force to open the corresponding conduit in response to movement of the operating lever.

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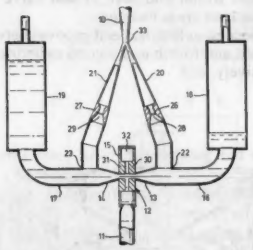
**4,313,470**

## FLUIDIC FLOW ARRESTER

**John R. Tippetts, Sheffield, England, assignor to United Kingdom Atomic Energy Authority, England**

**Filed Aug. 22, 1979, Ser. No. 68,722**
**Claims priority, application United Kingdom, Sep. 5, 1978, 35669/78**
**Int. Cl.³ F15C *1/14***
**U.S. Cl. 137—821** **7 Claims**



**1.** A fluidic arrester device for arresting a mainstream flow of fluid, such device comprising a control stream passage, a mainstream passage including an inlet, modulator means, and a mainstream outlet in permanently open communication with the control stream passage, said control stream passage intersecting said mainstream passage upstream of said modulator means, said mainstream passage having multiple branches providing intersection of the control stream passage at at least two locations disposed symmetrically to either side of the mainstream modulator means, means to reciprocate a control stream of fluid in said control stream passage back and forth substantially uninterruptedly across the modulator means to block the mainstream from the outlet for inhibiting access of the mainstream from the mainstream inlet to the mainstream outlet, and means to discontinue selectively the reciprocation of the control stream so that full flow of the mainstream to and through the mainstream outlet may occur.

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**4,313,471**

## FLOW CONTROL

**Frederic Lissau, Chicago, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.**

**Continuation of Ser. No. 957,155, Nov. 2, 1978, abandoned, which is a continuation of Ser. No. 930,605, Aug. 3, 1978, abandoned. This application Sep. 4, 1980, Ser. No. 184,142**
**Int. Cl.³ B05B *15/02*; F15D *1/02***
**U.S. Cl. 138—45** **1 Claim**

**1.** In an automatic water flow control device in the form of an annulus made of a distortable material having the general characteristics of rubber as to flexibility and distortability and having a generally annular supporting rim portion for use in mounting the flow control device, the rim bounding a generally central flexing convex-concave portion, convex on one side and concave on the other, a generally centrally located,

generally polygonal shaped aperture in the central portion forming a first flow passage, each of the sides of the polygon having a generally curvilinear cross-sectional groove therein constructed and arranged such that when the incoming water pressure is applied to the convex side of the central portion causing the sides thereof to converge inwardly and to contact

each other, the grooves will be brought together thereby forming a constant cross-section second flow passage with a generally uniform flow therethrough, the aperture forming the first flow passage being generally triangular in cross-section in its relaxed state and thereby having three sides, each of which has a generally curvilinear cross-sectional groove formed intermediate the ends thereof.

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**4,313,472**

## ELECTRONIC DEVICE FOR MONITORING THE WEFT INSERTION ON A GRIPPER SHUTTLE WEAVING MACHINE COMPRISING A COLOR CHANGER

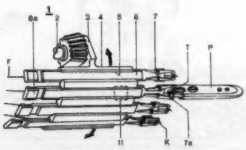
**Erich Weidmann, Wetzikon, Switzerland, assignor to Gebrüder Loepfe AG, Wetzikon, Switzerland**

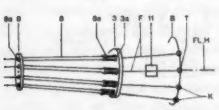
**Filed Jan. 14, 1980, Ser. No. 111,771**

**Claims priority, application Switzerland, Jan. 29, 1979, 838/79**

**Int. Cl.³ D03D *51/34***

**U.S. Cl. 139—370.2** **6 Claims**





**1.** An electronic device for monitoring the insertion of weft threads into a weaving shed on a gripper shuttle weaving machine equipped with a color changing mechanism, comprising a substantially cylindrical shell having an interior surface and rotatably mounted on a changer shaft and provided with grooves in substantially parallel relationship to the changer shaft, each groove receiving a retract rod bearing a weft clamp for transferring, at a transfer point, one at a time of a multiplicity of threads drawn from supply bobbins, to a gripper shuttle ready for insertion into the weaving shed, wherein:

a signal generator responsive to longitudinal movement of the thread to be inserted is fixedly mounted at the weaving machine between the interior surface of the cylindrical shell and the changer shaft in a position antecedent to the transfer point essentially on a level with the gripper shuttle and such as to face the weft thread ready for insertion without contacting the same.

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**4,313,473**

## PROCESS AND THREAD INSERTER FOR THE MANUFACTURE OF BELTING WITH TUBULAR EDGE PORTIONS

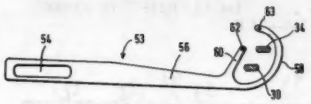
**Erich Reiter, Mutlangen, Fed. Rep. of Germany, assignor to Johann Berger and Josef Berger, both of Schwabisch Gmund, Fed. Rep. of Germany**

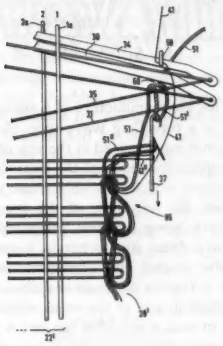
**Filed Jun. 12, 1980, Ser. No. 158,808**

**Claims priority, application Fed. Rep. of Germany, Jun. 23, 1979, 2925413; Nov. 8, 1979, 2945078**

**Int. Cl.³ D03D *47/42***

**U.S. Cl. 139—432** **15 Claims**





**1.** A process for the manufacture of belting having a single layer central portion and two tubular edge portions on a needle belt weaving loom provided with a knitting needle, the process comprising the steps of:

(a) weaving both tubular edge portions in the form of single layer edge parts;

(b) forming stitches at the outer edge of one edge part by means of the knitting needle;

(c) closing both edge parts by weft thread tension to form the tubular edge portions;

(d) drawing loops from the stitches pulled to the edge of the central portion into the central portion by weft thread tension, characterised by the following features:

(e) two weft threads are inserted simultaneously at each pick by means of two weft thread insertion needles;

(f) for anchoring one weft thread at the outer edges of the edge parts a common shed for both weft thread insertion needles is formed at least on the insertion side by the two outer edge warp threads;

(g) for weaving the edge parts between the central portion and the two outer edge warp threads an upper and a lower shed are formed, of which one shed accepts the first weft thread insertion needle which forms the edge fabric, and the other shed the second weft thread insertion needle of which the weft thread binds only with at least one of the two outer edge warp threads;

(h) a loop is drawn by the knitting needle outside one of the edge parts through a loop of at least one of the weft threads to form a stitch;

(i) the two weft threads are positively fed and the length fed of the first weft thread is greater by at least the width of the two edge parts than the length fed of the second weft thread.

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**4,313,474**

## METHOD FOR THE MANUFACTURE OF A MICROWAVE DELAY LINE AND MICROWAVE DELAY LINE OBTAINED BY THIS METHOD

**René Nazet, and Pierre Ribout, both of Paris, France, assignors to Thomson-CSF, Paris, France**

**Filed Dec. 20, 1979, Ser. No. 105,507**
**Claims priority, application France, Dec. 27, 1978, 78 36486**
**Int. Cl.³ B21F *3/10, 45/00***
**U.S. Cl. 140—71 R** **6 Claims**

1. A method for the manufacture of a microwave delay line which ensures, in a travelling wave tube, the interaction between an electron beam focussed in the axis of the line and the fundamental propagation mode of the hyperfrequency travelling wave traversing said line, with a phase velocity close to that of the beam, the amplitude of the inverse propagation mode of the wave being reduced compared with that of a helical microwave delay line, wherein it comprises using a single metal wire shaped into contiguous coils, these coils being deformed at regular intervals in a direction corresponding to the longitudinal axis of the coils, which constitutes the axis of the line, in such a way that the line is constituted by a succession of identical groups of three coils in which the first and third coils have substantially equal, but oppositely directed inclinations compared with the longitudinal axis of the coils and in which half of the second coil remains contiguous with the first coil and the other half remains contiguous with the thirds coil.

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**4,313,475**

## VOLTAGE BLOCK SYSTEM FOR ELECTROSTATIC COATING WITH CONDUCTIVE MATERIALS

**Richard F. Wiggins, Fairfield, Conn., assignor to The Gyromat Corporation, Bridgeport, Conn.**

**Filed Jun. 26, 1980, Ser. No. 163,158**
**Int. Cl.³ B65B *3/04***
**U.S. Cl. 141—18** **11 Claims**

1. A supply system for furnishing conductive coating materials to an electrostatic coating device, which comprises

(a) a recirculating primary supply of liquid coating material,

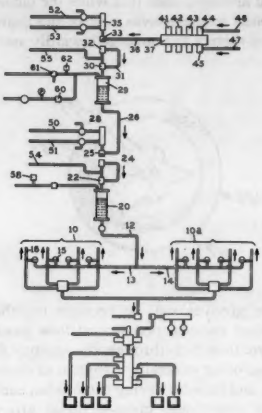
(b) a spray device for applying said coating material to a workpiece,

(c) means for imparting a high voltage charge to said spray device,

(d) a sealed coating material vessel communicating with said spray device,

(e) means for periodically replenishing said vessel with coating material from said primary supply,

(f) means for electrically isolating said vessel from said primary supply when said high voltage is applied to said spray device,



(g) means for placing said sealed vessel under gas pressure to effect displacement of coating fluid to said spray device.

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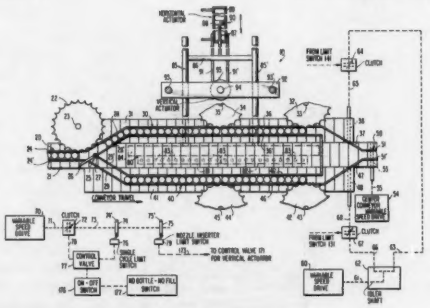
**4,313,476**

## DUAL LANE FILLING MACHINE

**Richard N. Bennett, Arbutus, and Lawrence W. Buckley, Baltimore, both of Md., assignors to National Instrument Company, Inc., Baltimore, Md.**

**Filed Oct. 26, 1979, Ser. No. 88,340**
**Int. Cl.³ B65B *43/54***
**U.S. Cl. 141—59** **42 Claims**



1. A filling machine with a filling station for filling containers with a fluid product by the use of filling nozzle means, which comprises two substantially parallel filling channel means within the area of the filling stations which are defined at least in part by conveyor means, filling means operatively connected with the filling nozzle means, nozzle support means supporting thereon the filling nozzle means in proper position, means for lowering and raising the nozzle support means and therewith the filling nozzle means into and out of containers held stationary under the filling nozzle means, indexing means for determining the correct number of containers to be filled at the same time in a respective filling channel means during a given filling operation while held stationary in their filling position, reciprocating means for the nozzle support means to alternately place the filling nozzle means over the containers to be filled in one filling channel means and after completion of the filling operation to move the nozzle support means gener-

ally transversely to the direction of movement of the conveyor means over filling channel means to fill the containers which have been brought into filling position in the meantime in said other filling channel means and which are held stationary thereat during the filling operation, and means for operating the filling machine through at least one control cycle including control means for the indexing means, the reciprocating means, the means for lowering and raising the nozzle support means and the filling means, characterized in that each channel means includes a separate conveyor means, said control means including further means for individually controlling each separate conveyor means for individually controlled intermittent operation thereof to enable stoppage of a respective separate conveyor means while containers conveyed thereby are being filled.

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**4,313,477**

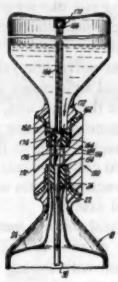
## LIQUID TRANSFER ASSEMBLY

**Adam Sebalos, 140 Charles St., Jersey City, N.J. 07307**

**Division of Ser. No. 25,852, Apr. 2, 1979, Pat. No. 4,265,374. This application Nov. 10, 1980, Ser. No. 205,331**

**Int. Cl.³ B65B** *3/06*

**U.S. Cl. 141—301** **3 Claims**



1. A liquid transfer assembly for use in filling containers with liquid comprising: a main body secured directly to said container being filled and including an air passageway in communication at a first end with the interior of said container being filled for releasing air from within said container as liquid enters into said container, an interior liquid transfer passageway disposed in and extending centrally through said body and in communication at one end with the interior of said container being filled for enabling liquid to pass centrally through said body into said container, floating valve means operably associated with said air passageway at the end thereof opposite said first end and responsive to air flow through said air passageway for preventing liquid from flowing therethrough, said floating valve means normally closing said opposite end of said air passageway and opening in response to air exhausting therethrough during liquid filling of said container, said air passageway having a first portion extending upwardly away from said main body and a second portion within said main body being disposed outward of said central liquid passageway, including a member adapted to be inserted in and support a container from which liquid will be transferred and supporting said first portion of said air passageway centrally therein above said liquid passageway in said main body, said member having a first laterally directed passage for communicating the interior of the container from which liquid will be transferred with said central liquid passageway, and a second laterally directed passage for connecting said first portion of said air passageway with said second portion of said air passageway.

**4,313,478**

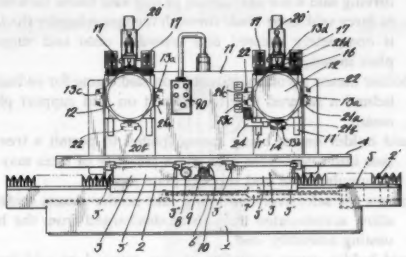
## WOOD WORKING ROUTER

**Yukitomo Suzuki, Hamamatsu, Japan, assignor to Helan Iron Works, Ltd., Hamamatsu, Japan**

**Filed Sep. 18, 1979, Ser. No. 76,791**

**Int. Cl.³ B23B** *7/04*

**U.S. Cl. 144—1 A** **6 Claims**



1. A wood working router comprising a machine base, a table carriage unit movable in a first direction relative to said machine base, a suction-type workpiece holding table unit movable in said first direction together with said table carriage unit and also in a second direction normal to said first direction relative to the carriage unit, a column secured to and extending uprightly from said machine base, at least one turret head mounted on said column for vertical movement and rotation relative to the column and having a plurality of angularly spaced cutting tools extending radially and outwardly about the turret head, a corresponding number of motors attached to said cutting tools for individually driving the tools, a mechanism for intermittently rotating and vertically moving said turret head and selecting said cutting tools on the turret head and a release mechanism for releasing a workpiece held on said suction-type table unit under suction from the table unit.

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**4,313,479**

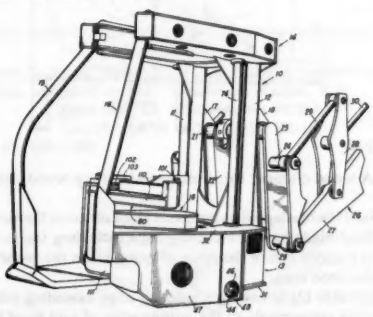
## DRAW SHEAR

**Samuel J. Coughran, Jr., Cedartown, Ga., assignor to Rome Industries, Inc., Cedartown, Ga.**

**Filed Jun. 29, 1976, Ser. No. 700,881**

**Int. Cl.³ A01G** *23/08*

**U.S. Cl. 144—3 D** **28 Claims**



1. A tree harvesting assembly comprising, in combination: a frame adapted to be attached to a powered vehicle and having spaced, vertically extending leg portions, a generally U-shaped lower frame portion and a generally U-shaped upper frame portion, said frame portions being interconnected by said leg portions thereby defining a vertically elongate cradle for receiving the butt end of a

standing tree, and fixed support plate means at the lower end of said cradle and extending forwardly from the closed inner side of said lower frame portion to terminate in a shear blade spaced inwardly from the open end of said lower frame portions;

draw arm means pivotally mounted on said frame for reaching behind a tree, and including fluid-actuated means for driving said draw arm means to pull said frame forwardly to force said shear blade through the tree whereby the tree is completely sheared and crowded onto said support plate means; and

holder means pivotally mounted on said frame for swinging behind a severed tree to retain it on said support plate means;

said holder means being spring loaded to permit a tree to pass into said cradle whereby a plurality of trees may be accumulated on said support plate means;

means for selectively swinging said holder means aside to allow accumulated trees to be discharged from the harvesting assembly; and

said holder means including an arm pivoted on said frame adjacent the lower end of said cradle and another arm pivoted on said frame adjacent the upper end of said cradle, said means for selectively swinging including a vertical shaft connected to one of said pivoted arms.

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**4,313,480**

## FIREWOOD CHOPPER

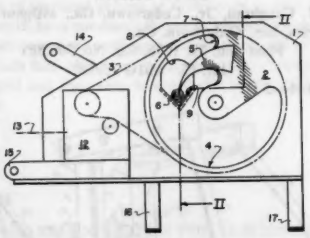
**Jaakko Pöntelin, 54920 Taipalsaari, Finland**

**Filed Jun. 13, 1980, Ser. No. 159,164**

**Claims priority, application Finland, Jun. 15, 1979, 791906**

**Int. Cl.³ B27L 7/00**

**U.S. Cl. 144—193 R** **9 Claims**



1. A wood chopper for splitting and cutting wood comprising:

a fixed blade adapted to receive a piece of wood thereon, the fixed blade having a cutting edge extending transversely to a major axis of the piece of wood when the wood is on the fixed blade;

a movable blade having a splitting edge extending substantially transversely to the cutting edge of said fixed blade, said movable blade increasing in width in a direction away from said splitting edge; and

drive means connected to said movable blade for moving said splitting edge in a path adjacent to, on one side of and past said cutting edge, so that a piece of wood received on said cutting edge is split by said splitting edge when said splitting edge moves past said cutting edge, and cut by said cutting edge.

**4,313,481**

## LOG SHEARING DEVICE

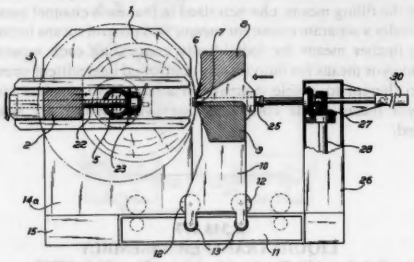
**Angelo Cremona, Viale Lombardia 275, Monza, Italy 20052**

**Filed Dec. 6, 1979, Ser. No. 101,003**

**Claims priority, application Italy, Jul. 19, 1979, 24486 A/79**

**Int. Cl.³ B27L 5/02**

**U.S. Cl. 144—209 B** **12 Claims**



1. A device for shearing a log longitudinally disposed on a fixed axis of rotation through a curved cutting path having a variable radius of curvature about the fixed axis to produce a thin sheet comprising,

a beam for supporting and blocking the log to be cut,

slide means including elongated slides, transversely mounted relative to the fixed axis, slidably supporting and guiding said beam for linear movement relative to the fixed axis,

means for rotating said slide means and said beam with the log to be cut about the fixed axis,

cutting means for shearing the log to be cut mounted for rectilinear movement relative to the fixed axis,

means for shifting said cutting means and said beam with the log to be cut in synchronization with the rotation of said log about the fixed axis, and

means for adjusting said shifting means to adjust one of the rectilinear motion of said cutting means and the linear motion of said beam with the log to be cut thereby variably adjusting the radius of curvature and thickness of the sheet.

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**4,313,482**

## PNEUMATIC TIRE AND PROCESS FOR ITS MANUFACTURE

**Paul Vente, Leverkusen; Richard Juffa, Cologne; Dieter Seidenschnur, Neunkirchen-Seelscheid, and Ulrich Knipp, Berg.-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Nov. 9, 1977, Ser. No. 849,750**

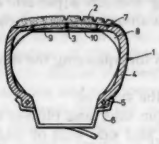
**Claims priority, application Fed. Rep. of Germany, Nov. 13, 1976, 2651876**

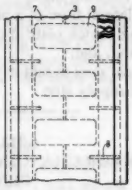
**Int. Cl.³ B60C 5/00, 13/00**

**U.S. Cl. 152—330 R** **15 Claims**

1. A pneumatic tire comprising a tread surface and two separate side parts of an elastomeric synthetic resin, wherein the side parts not only form the side walls of the tire but each extends from a rim wire to the midline of the tire and therefore also forms the foundation for the tread surface of each side of the tire, characterized in that

(a) the tread surface and a layer under the foundation of the tread surface consist of a tread surface elastomer and





(b) the tread surface and layer under the foundation of the tread surface are joined through apertures in the foundation of the tread surface.

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**4,313,483**

## APPARATUS FOR REGULATING THE AIR PRESSURE IN TIRES OF CROSS-COUNTRY VEHICLES

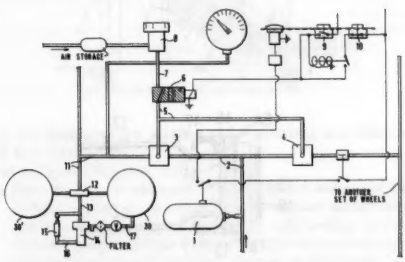
**Heinrich Brockmann, Eisenacher-Strasse 1, 6750 Kaiserslautern, Pfalz, Fed. Rep. of Germany**

**Filed May 14, 1979, Ser. No. 38,524**

**Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2823045**

**Int. Cl.³ B60C *23/10***

**U.S. Cl. 152—416** **4 Claims**




1. Apparatus for regulating the air pressure in tires of wheel pairs mounted on axles of cross country vehicles, especially amphibian vehicles, of the type having a source of compressed air, at least one relay valve connected to such compressed air source, a pressure and venting valve connected to said relay valve controllable on one side by a pressure key and on the other side by a venting key, a preselecting switch connected to the pressure side of said pressure and venting valve, a compressed air pipe extending from said relay valve to an axle of the vehicle, and separate means connecting the said compressed air pipe to each of the tires of said axle, the improvement wherein each of said means connecting the compressed air pipe line to the tires consisting essentially of

a wheel control valve with a valve head, adapted to pass air to the tire at pressures above the lowest pressure for said tire,

a relief valve,

an air pressure line connected to one side of each of said wheel control valve and relief valve,

an air pressure line connecting a second pressure side of said relief valve to the head side of said wheel control valve whereby air passing said relief valve is applied against the head side of said wheel control valve.

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**4,313,484**

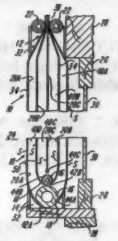
## SELF-INFLATING SOLAR CURTAIN

**Ronald H. Shore, P.O. Box 238, Snowmass, Colo. 81654**

**Filed Sep. 15, 1977, Ser. No. 833,581**

**Int. Cl.² E06B *9/17***

**U.S. Cl. 160—121 R** **25 Claims**



1. In combination in an air bag curtain which inhales or exhales responsive to changes in ambient temperatures, thereby providing a self-inflating or deflating insulating assembly: a first generally rectangular sheet of flexible material folded in half and hung from the margins thereof opposite said fold so as to provide a double-paneled curtain with vertically-disposed side margins, said curtain including openings therein adjacent the fold for the intake and expulsion of air; means engaging the side margins of said curtain cooperating therewith to seal the latter and define a first closed-top air bag which inhales responsive to a heating of air within said bag with a consequent increase in air bag volume; means including a horizontal deflation slot disposed above said first air bag effective to expel air through the openings therein when said curtain is drawn upwardly through said slot; spreader means cradled within the fold in the curtain effective to define a pocket holding residual air which expands and therefore fills said first bag when the air therein is heated; and storage means located above the slotted means suspending the curtain therein for movement therethrough between raised and lowered positions.

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**4,313,485**

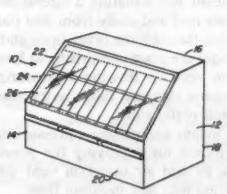
## TRANSPARENT ACCESS CURTAIN FOR COOLERS AND THE LIKE

**Kenneth N. Gidge, Nashua, N.H., and Henry J. Richard, Lowell, Mass., assignors to BSL Corporation, Nashua, N.H.**

**Filed Nov. 13, 1979, Ser. No. 93,193**

**Int. Cl.³ A47H *23/01, 23/05, 23/10***

**U.S. Cl. 160—328** **10 Claims**



1. An access curtain for use over the opening in an open display-type refrigerator, or the like, comprising

(a) a unitary sheet of flexible, transparent material of generally rectangular outline connectable along its upper edge to said refrigerator proximate to the upper edge of said

opening and of a length sufficient to span said opening and overhang the lower edge of said opening,

(b) said sheet being formed with a plurality of spaced parallel vertical slits entirely within the outer edges of said sheet and extending over a substantial portion of the curtain length to form a plurality of coplanar parallel integral strips sections arranged in abutting edge to edge relation, and,

(c) weight means connected along the lower edge of said sheet.

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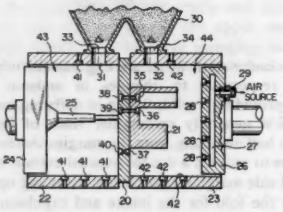
**4,313,486**

**SAND MOLD-PRODUCING METHOD AND APPARATUS**

**Iwao Kondo, and Toshiyuki Shioda, both of Obu, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan**

**Filed Jul. 7, 1980, Ser. No. 166,350**
**Claims priority, application Japan, Jul. 11, 1979, 54/88644**
**Int. Cl.³ B22C *15/24***
**U.S. Cl. 164—38** **9 Claims**




1. A sand mold-producing apparatus comprising:

a stationary framework to provide a rigid construction for the apparatus and to establish a working area;

a sand blower means mounted on said framework and having at least a vertical sand supply port for vertically supplying sand under a first pressure of air;

at least one molding flask disposed in the working area, said molding flask having therein a flask cavity enclosed by a side wall formed with a sand inlet port connectable to the vertical sand supply port of said sand blower means and vent through-holes for connecting said flask cavity with the atmosphere, said molding flask further having two laterally spaced apart open ends lying in substantially vertical planes, respectively;

a match plate mounted for being mated in position with one of said open ends of said molding flask, said match plate mounting thereon a pattern which is positioned in the flask cavity of said molding flask when said match plate is mated with said one of said open ends of said molding flask;

at least a squeeze means comprising a squeeze plate and actuator means for actuating a lateral movement of said squeeze plate into and away from said flask cavity of said molding flask through the other open end of said molding flask, said squeeze plate comprising at least one horizontal air injection vent for flowing a pressurized air having a second pressure into said flask cavity toward said pattern of said match plate, and;

an air source means comprising a pressurized air source and a conduit means for supplying the pressurized air from said source to said air injection vent when said sand is being supplied into said molding flask.

9. A sand mold-producing method using a machine including:

a sand blower for supplying sand with the help of a pressurized air;

at least one molding flask having a laterally extending side wall forming therein a flask cavity and vent holes connecting said flask cavity to the outside atmosphere, said molding flask further having two laterally spaced apart open ends lying in vertical planes, respectively;

a match plate carrying thereon a pattern and capable of being tightly mated with one of said two open ends of said molding flask, and;

a sand squeezing means for squeezing the sand in said molding flask,

said method comprising the steps of:

supplying said sand from said sand blower through a sand inlet port formed in said side wall of said molding flask into said molding flask;

injecting a lateral flow of a pressurized air toward said pattern of said match plate at the same time as said supplying of said sand, and;

squeezing said sand in said molding flask after completion of said sand supply step.

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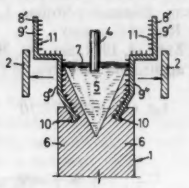
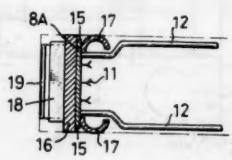
**4,313,487**

**APPARATUS FOR CHANGING THE WIDTH OF A CAST PIECE**

**Moriki Hashio, and Tomohiko Kimura, both of Ibaragi, Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan**

**Division of Ser. No. 931, Jan. 4, 1979. This application Nov. 27, 1979, Ser. No. 97,601**
**Int. Cl.³ B22D *11/04***
**U.S. Cl. 164—436** **14 Claims**




1. For use in a method of continuous casting of a cast piece which is rectangular in cross section, the rectangular cross section having first and second parallel sides of a first length and third and fourth additional parallel sides, a frame for reducing the length of the third and fourth additional parallel sides, said frame comprising a pair of opposite side plate members each of which (a) is disposed substantially vertically and extends substantially parallel to the other side plate member, (b) has an outer surface which is spaced from the outer surface of the other side plate member by a distance equal to the desired reduced length of the third and fourth additional sides, (c) is of width in the horizontal direction substantially equal to said first length, (d) has a lower end formed with an anchor for dipping in the cast piece, and (e) has an inner surface provided with spring means of semicircular section secured thereto along each end thereof for engaging walls of a continuous casting mold.

6. For use in a method of continuous casting of a cast piece which is rectangular in cross section, the rectangular cross section having first and second parallel sides of a first length and third and fourth parallel sides, a frame for increasing the length of the third and fourth additional parallel sides, said

frame comprising a pair of opposite side plate members each of which (a) consists of an upper portion and a lower portion, said upper portion being disposed substantially vertically and extending substantially parallel to the upper portion of the other plate member and having an outer surface which is spaced from the outer surface of the other side plate member by a distance equal to the desired increased length of the third and fourth additional sides, and said lower portion having an outer surface which is spaced from the outer surface of the lower portion of the other side plate member by a distance not greater than the existing length of the third and fourth additional parallel sides, (b) is of width in the horizontal direction substantially equal to said first length, and (c) has a lower end formed with an anchor for dipping in the cast piece and spaced from the anchor of the other side plate member by a distance less than the existing length of said third and fourth parallel sides.

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## 4,313,488
## APPARATUS FOR GUIDING AND SUPPORTING A CONTINUOUSLY CAST SLAB

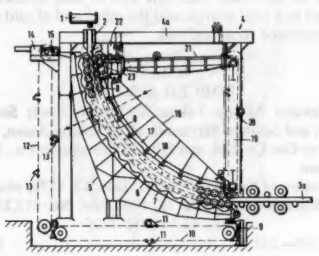
**Bertrand Reymont, Zurich, Switzerland, assignor to Alfred Wertli Inc., Winterthur, Switzerland**

**Filed Mar. 17, 1980, Ser. No. 131,115**

**Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913440**

**Int. Cl.³ B22D *11/00***

**U.S. Cl. 164—448** **10 Claims**



1. An apparatus for guiding and supporting a continuously cast slab comprising

an elongated support surface, and

a plurality of rolls disposed on said support surface in freely rolling relation to travel along said support surface and to guide a slab therealong, each said roll having an axis of rotation perpendicular to the direction of travel along said support surface and having a distance wheel with an axis of rotation coextensive with said axis of rotation of said roll mounted at each end of each roll in contact with a distance wheel of an adjacent roll, said distance wheels of each alternating roll being fixedly mounted thereon and non-rotatable relative to their associated alternating roll and the remainder of said rolls having said distance wheels rotatably mounted thereon for rotation relative to their associated roll.

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## 4,313,489
## TURNDOWN INDICATOR FOR ROTARY REGENERATIVE HEAT EXCHANGER

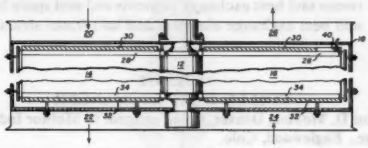
**Richard F. Stockman, Friendship, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.**

**Filed Feb. 22, 1980, Ser. No. 123,590**

**Int. Cl.³ F28D *19/00***

**U.S. Cl. 165—9** **4 Claims**

1. In combination with a rotary regenerative heat exchange apparatus having a hollow cylinder rotor, a central rotor post about which the rotor rotates, a mass of heat absorbent material carried within the rotor, a housing surrounding the rotor including inlet and outlet ducts at opposite ends thereof for establishing a first fluid passageway for passing a heating fluid through the rotor and a second fluid passageway for passing a fluid to be heated through the rotor in a direction opposite to the flow of the heating fluid, a sector plate disposed at the hot end of the rotor at a location intermediate the end of the rotor and the rotor housing adapted to maintain the heating fluid entering the rotor separate from the heated fluid leaving the rotor and a plurality of radial seals mounted on the end face of the rotor at spaced intervals about the rotor post so as to contact the sector plate and thereby establish a sealing relationship between the rotor and the sector plate; a turndown indicator comprising:



a. a fixed length of flexible tubular cable housing extending from the sector plate through the rotor housing to a location external thereto;

b. a flexible cable adapted to move slidably through said tubular cable housing, said flexible cable havng a first end extending out of the end of said tubular cable housing located external to the rotor housing and a second end extending out of the opposite end of said tubular cable housing to a location in close proximity with the radial seals; and

c. indicator means operatively associated with said flexible cable for indicating the amount of displacement of said flexible cable from a set position.

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## 4,313,490
## HEAT EXCHANGER

**Hermann Heeren, Nuremberg, and Liselotte Kraetschmer, Hanover, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg Nurnberg Aktiengesellschaft, Nürnberg, Fed. Rep. of Germany**

**Division of Ser. No. 780,280, Mar. 23, 1977, Pat. No. 4,206,738. This application Jul. 2, 1979, Ser. No. 53,800**

**Claims priority, application Fed. Rep. of Germany, Mar. 23, 1976, 2612158; Feb. 25, 1977, 2708162; Feb. 25, 1977, 2708163**

**Int. Cl.³ F28F *7/00***

**U.S. Cl. 165—82** **6 Claims**

1. A heat exchanger for use with a draught generating shell of a dry cooling tower with tube-heat-exchanger elements of air-tube type for cooling a heat transfer medium by a gaseous medium having a considerably lower heat transfer coefficient than does said heat transfer medium, especially water by air, which comprises in combination:

a plurality of box-shaped heat exchange elements each of which includes substantially horizontal top and bottom wall means spaced from each other, flexurally soft side wall means interconnecting said top and bottom wall means so that said heat exchanges elements are closed on all sides, and tubes substantially parallel to said flexurally

soft side walls and substantially perpendicular to said top and bottom wall means respectively for conveying gaseous medium through said tubes, each of said heat exchange elements being provided only with inlet and outlet means for conveying said heat transfer medium into and out of said heat exchange elements respectively;

a frame structure for holding said heat exchanger elements, said frame structure being flexurally stiff in the area of said heat exchange elements, said heat exchange elements being spaced from one another and from said frame structure; and

pressure-resistant filling compound filling said space between said heat exchange elements and said space between said heat exchange elements and said frame structure.

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**4,313,491**

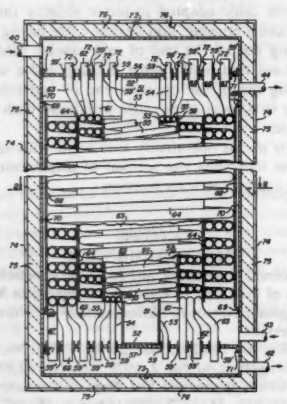
## COILED HEAT EXCHANGER

**Victor D. Molitor, Denver, Colo., assignor to Molitor Industries, Inc., Englewood, Colo.**

**Division of Ser. No. 920,660, Jun. 30, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,305**

**Int. Cl.³ F28F 9/22; F28D 7/02, 7/04**

**U.S. Cl. 165—83** **3 Claims**



1. A heat exchanger comprising:

a central cylinder;

a tube forming a spiral coil in pressure contact with said central cylinder;

a series of additional tubes forming spiral coils in lateral relation to and having essentially the same spiral as said first coil, the turns of each coil being in pressure contact with the turns of the next inner coil;

a sheath in pressure contact with the outermost coil, whereby a spiral path provides for flow of a liquid between said coil turns from one end of said coils to the other, and whereby said liquid follows an elongated path corresponding to the path of travel of said liquid within said coils;

means for supplying a first liquid to one end of each tube;

means for withdrawing said first liquid from the opposite end of each said tube;

means for supplying a second liquid to the spiral path between turns of said coils, at one end of said coils;

means for withdrawing said second liquid from said spiral path at the opposite end of said coils;

an outward offset at each end of said sheath; and

an outer cylinder to which said offsets are attached, the space between said sheath and said outer cylinder permitting lateral expansion of said coils and sheath.

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**4,313,492**

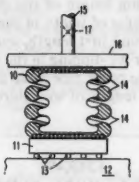
## MICRO HELIX THERMO CAPSULE

**Frank E. Andros, Binghamton, N.Y., and Robert J. E. Shay, Salisbury, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 20, 1979, Ser. No. 105,677**

**Int. Cl.³ F28D 15/00**

**U.S. Cl. 165—104.26** **6 Claims**



1. A heat transfer device comprising a closed container and a quantity of coolant liquid therein, said container comprising a flexible cylindrical bellows having a helical convolution extending from one end to the other end to provide at least one capillary passage therein joining the inside opposite ends of said container, said capillary passage having an interior cross section selected to provide capillary flow from one end of said container to the other end, one end of said container being juxtaposed to a heat source, and the other end of said container being juxtaposed to a heat sink.

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**4,313,493**

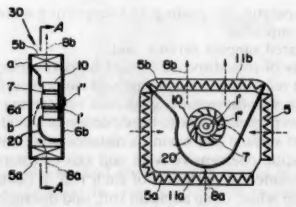
## FORCED AIR UNIT

**Akira Kawase; Masao Takouchi; Yoshio Tsuji; Sadao Mitsumeri, and Susumu Miyazaki, all of Tokyo, Japan, assignors to Tokyo Gas Co. Ltd. and Hitachi Seisakusho Co., Ltd., both of, Japan**

**Continuation of Ser. No. 729,703, Dec. 13, 1976, abandoned. This application Jan. 15, 1980, Ser. No. 112,230**

**Int. Cl.³ F24H 3/06**

**U.S. Cl. 165—122** **11 Claims**



1. A forced-air unit comprising a front cover member, a rear cover member connected to and spaced from said front cover member defining a unit housing having a depth between said cover members and a periphery, heat exchanger means extending along the substantial portion of said housing periphery, a sirocco fan rotatably mounted in said unit housing on an axis of rotation extending in the depth direction of said unit housing, said fan having a central inlet area and an annular outlet area for moving air radially outwardly of said annular outlet area and axially inwardly of said central inlet area when said fan rotates, a motor connected to said fan for rotating said fan to induce air axially into said inlet area and radially out through said outlet area, and a fan casing connected in said unit housing extending from said cover members and over said fan and having an inlet opening over said inlet area of said fan, said casing intersecting said heat exchanger means at two spaced locations thereof on said housing periphery, said fan casing defining with said front cover member an inlet space and said casing including an outlet area covering a portion of said

housing periphery between said two spaced locations of said heat exchanger means defining an outlet port with said rear cover member, the remainder of said housing periphery comprising a housing inlet port for said inlet space whereby, with the rotation of said fan, a portion of air is caused to move radially inwardly of a portion of said heat exchange means through said inlet port and into said inlet space, around said fan casing in through said inlet opening of said fan casing and radially outwardly through said outlet port, said heat exchanger means disposed radially outwardly of said fan and substantially therearound and including at least one portion in said outlet port and at least one portion in said inlet port.

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**4,313,494**

## PLATE HEAT EXCHANGER

**Folke Bengtsson, Stockholm, Sweden, assignor to Carl Johan Lockmans Ingenjorsbyra, Stockholm, Sweden**

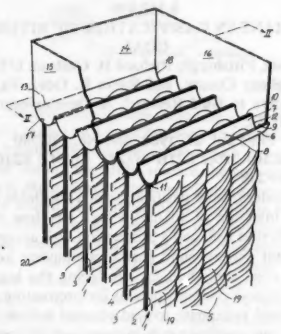
**PCT No. PCT/SE79/00115, § 371 Date Jan. 22, 1980, § 102(e) Date Dec. 27, 1979, PCT Pub. No. WO79/01098, PCT Pub. Date Dec. 13, 1979.**

**PCT Filed May 22, 1979, Ser. No. 189,928**

**Claims priority, application Sweden, May 22, 1978, 7805829**

**Int. Cl.³ F28F *3/12***

**U.S. Cl. 165—148** **10 Claims**



1. A plate heat exchanger comprising a plurality of plates arranged in substantially parallel spaced relationship, each plate consisting of two sheets facing toward each other and welded along two parallel edges, said sheets being formed with longitudinal valleys, which facing toward each other form passages between the sheets when the sheets abut each other, said valleys being formed with impressed grooves extending transversely to the longitudinal direction of the valley and continuously from one outermost located valley to the outer outermost located valley, said grooves extending at a certain acute angle to the longitudinal direction of the valleys, said cross-sectional shape of the valleys being assymetric relative to the longitudinal center line of the valley.

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**4,313,495**

## DOWNHOLE PUMP WITH PRESSURE LIMITER

**John T. Brandell, Duncan, Okla., assignor to Halliburton Services, Duncan, Okla.**

**Filed Jun. 13, 1980, Ser. No. 159,305**

**Int. Cl.³ E21B *43/12***

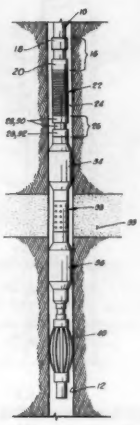
**U.S. Cl. 166—53** **50 Claims**

1. A pressure limiter for a downhole pump, said pressure limiter comprising:

a housing having first and second housing parts, and having a fluid passage means disposed therein for communication with a discharge of said downhole pump;

clutch means connected to said first and second housing parts and movable between an engaged position for preventing relative rotational movement between said first and second housing parts and a disengaged position for allowing relative rotational movement between said first and second housing parts;

biasing means, operatively associated with said clutch means, for biasing said clutch means toward its engaged position; and



piston means, operatively associated with said clutch means and communicated with said fluid passageway, for overcoming said biasing means and for moving said clutch means to its disengaged position at a predetermined fluid pressure level in said fluid passageway.

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**4,313,496**

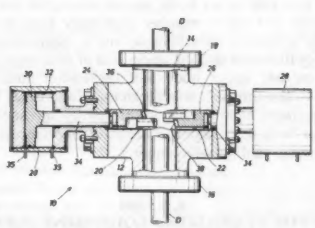
## WELLHEAD SHEARING APPARATUS

**Eric G. Childs, Katy, and Friedrich E. Just, Houston, both of Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.**

**Filed Apr. 22, 1980, Ser. No. 142,689**

**Int. Cl.³ E21B *29/08***

**U.S. Cl. 166—55** **8 Claims**



1. A ram-type shearing apparatus for a wellhead comprising

a body having a bore therethrough and ram guideways extending laterally from opposite sides of the bore,

a ram assembly comprising first and second rams, each located in one of the ram guideways, and means for reciprocating the rams into and from the bore,

each ram having a cutting blade in position for the cutting edge of the blade on one ram to pass just below the cutting edge of the blade on the other to shear an object positioned in the bore when the rams are moved together into the bore, and

each ram having an arm secured to its side and extending toward the other ram,

one such arm overlapping its opposite arm to prevent vertical separation of the blades.

**4,313,497**

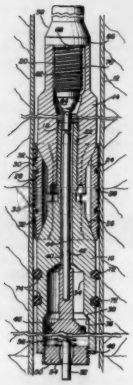
## PRESSURE CONTROL VALVE

**Rickey T. Graham, P.O. Box 1239, Bruceville, Tex. 76630**

**Filed Mar. 18, 1980, Ser. No. 131,550**

**Int. Cl.³ E21B *23/06***

**U.S. Cl. 166—124** **10 Claims**



1. A pressure control valve including upper and lower tubular bodies each including upper and lower ends, the lower and upper ends of said upper and lower bodies, respectively, including axially spaced downwardly and upwardly tapering outer conical wedge surface portions, a plurality of wedge surface equipped slips spaced about said wedge surface portions and expandable and retractable radially of said bodies upon movement of said bodies toward and away from each other, one of said bodies including an externally threaded tubular extension projecting toward and threaded into the adjacent end of the other body, said lower body defining a downward facing valve seat, a valve member including an upstanding shank and an enlarged head on the lower end of said shank, said valve member being reciprocally received in said lower member with said head opposing and upwardly displaceable against said seat and said shank projecting upwardly through said seat, said lower body, said tubular extension and into said upper body, means connected between said lower body and valve member yieldingly biasing the latter upwardly relatively to said seat, and a suspension member removably threaded into the upper end of said upper body, the threads on said upper body and suspension member being opposite to the threads on said extension and other body, and said suspension member being threadedly advanceable into said upper body to engage and downwardly depress said stem and thus open said valve member.

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**4,313,498**

## MEANS FOR STABILIZING EQUIPMENT SUPPORTED IN AN ENCLOSURE

**Eric J. Anderson, Bedford, England, assignor to Hayward Tyler Limited, Luton, England**

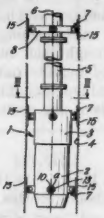
**Filed Aug. 28, 1979, Ser. No. 70,289**

**Claims priority, application United Kingdom, Aug. 29, 1978, 34808/78**

**Int. Cl.³ E21B *40/00***

**U.S. Cl. 166—206** **9 Claims**

1. Means for locking apparatus in a tube or frame having a longitudinal axis, including a plurality of locking devices operative between the apparatus and the tube or frame and having an engaging condition for preventing relative lateral movement between the apparatus and the tube or frame, the locking devices including a cam, at least one counterweight biasing the cam outwardly to a position, in use, to take up lateral free play between the apparatus and the tube or frame to thereby prevent said relative lateral movement, each said locking device comprising a U-shaped bracket, and a shaft pivotably mounted about an axis in the arms of the U-shaped bracket, the cam being fast on said shaft and said at least one counterweight also being fast on said shaft offset from the axis thereof and arranged to bias the cam to an engaging position, and external means for removing the apparatus from the tube or frame in a longitudinal direction, the apparatus being movable freely against the bias of the cams in said longitudinal direction by said external means.



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**4,313,499**

## SUBTERRANEAN GASIFICATION OF BITUMINOUS COAL

**Shirley C. Tsai, Pittsburgh; Richard H. Graham, O'Hara Township, Allegheny County, and Robin R. Oder, Export, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**Filed Jul. 21, 1980, Ser. No. 170,780**

**Int. Cl.³ C10J *5/00*; E21B *43/243, 43/247*; E21C *43/00***

**U.S. Cl. 166—248** **15 Claims**

1. In the underground gasification of a swellable bituminous coal by the injection of air into a high gas-flow channel between an injection well and a production well accompanied by the concurrent underground partial combustion and gasification of said coal, a method for producing the high gas-flow channel by reverse combustion and for pretreating and conditioning the coal proximate to said channel before said partial combustion and gasification is initiated which comprises the steps (a) injecting air heated to a temperature between about 100° C. and up to the softening temperature of the coal into said injection well through a low gas-flow path to said production well and starting a fire in said coal at the production well, whereby reverse combustion is initiated, and (b) continuing the injection of said heated air into said injection well at an appropriate combination of temperature and flow rate and for sufficient time to substantially reduce the swelling and increase the permeability of the coal proximate to the link until the reverse combustion flame front approaches the injection well producing a high gas-flow channel through the coal between said wells.

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**4,313,500**

## SACRIFICIAL ADSORBATE FOR SURFACTANTS UTILIZED IN CHEMICAL FLOODS OF ENHANCED OIL RECOVERY OPERATIONS

**James S. Johnson, Jr., Oak Ridge, and Clyde G. Westmoreland, Rockwood, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Aug. 20, 1980, Ser. No. 179,909**

**Int. Cl.³ E21B *43/22***

**U.S. Cl. 166—273** **7 Claims**

1. An improvement in the method of enhanced oil recovery wherein a water-based emulsion containing a surfactant is injected into an oil-containing subterranean earth formation for displacing oil therefrom for recovery purposes, said improvement comprising the injection of a sufficient quantity of a

solution selected from the group consisting of the effluent from the caustic extraction stage of the kraft wood pulp bleaching process and the weak black liquor from the pulp digester and pulp washer of the kraft process into the earth formation for adsorption thereby to effectively inhibit adsorption of surfactant constituents of the water-based surfactant emulsion.

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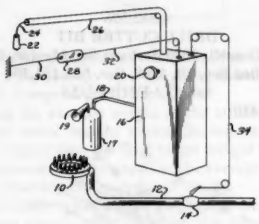
**4,313,501**

## FIRE EXTINGUISHING SYSTEM OF THE TYPE INCLUDING CONTAINER AND DRIVEN PROBE AGAINST A SEAL FOR RELEASE OF MATERIAL

**Robert D. Eckert, Wonder Lake, Ill., assignor to General Fire Extinguisher Corporation, Northbrook, Ill.**

**Filed May 12, 1980, Ser. No. 149,192**
**Int. Cl.³ A62C *37/12, 37/14***
**U.S. Cl. 169—58** **7 Claims**



**1.** In a fire extinguishing system including a vessel having an outlet normally sealed by a frangible seal, a probe aligned with said seal and mounted for movement in a path intersecting the seal, means for biasing the probe toward the seal and for driving the probe in the path with sufficient force to break the seal, and means for selectively restraining the probe in the path to prevent the breakage of the seal, the improvement wherein said restraining means includes a radially outwardly opening annular groove in said probe, at least one element having an exterior surface defined by a curve disposed such that said exterior surface partially enters said groove, a movable cam abutting said element oppositely of said groove and configured to cam said element partially into said groove, and a releasable latch for holding said cam in abutment with said element, said element, said cam and said groove further being constructed and arranged such that, upon release of said latch, said biasing and driving means will drive said probe to move said element against the unlatched cam and move the same to a position whereat the element escapes from the groove to fully release the probe.

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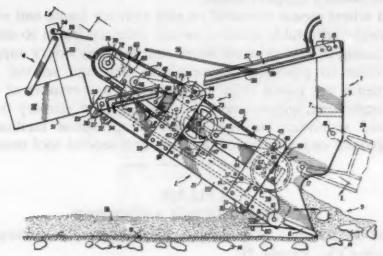
**4,313,502**

## ROCK EXTRACTOR APPARATUS AND METHOD

**Daniel L. Nelson, Rte. 1, South, Box 175, Seminole, Tex. 79360**

**Filed Jan. 24, 1980, Ser. No. 115,059**
**Int. Cl.³ A01B *43/00***
**U.S. Cl. 171—63** **28 Claims**

**1.** An apparatus for picking up dirt comprising blade means for picking up the dirt, conveyor means for rapidly moving the dirt rearwardly away from said blade means and support means for carrying said blade means and conveyor means; said conveyor means being disposed above and behind the leading edge of said blade means and extending upwardly and rearwardly from said blade means; said conveyor means including main frame members joined together by connecting means, said main frame members having rotatably mounted thereon at one end a pair of drive gears and at the other end a pair of idler wheels around which there are carried endless chains having disposed between them a plurality of evenly spaced paddles, means connecting said drive gears to a motor for driving said drive gears, said main frame members having a front and back pair of parallel lever arms pivotally connected at their back ends to said main frame members and extending forwardly and upwardly from said main frame members, and pivotally connected at their front ends to said support means, whereby said conveyor means can move vertically upward or downward relative to a line drawn through the longitudinal axis of said



conveyor means and relative to said blade means, while maintaining a parallel relationship with said drawn line; and stop means connected to said suport means and positioned relative to said conveyor means to limit the downward movement of said conveyor means.

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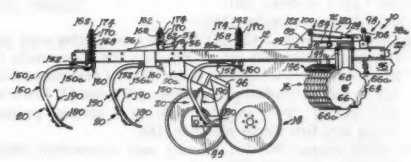
**4,313,503**

## AGRICULTURAL IMPLEMENT

**Garry R. Good, and Charles W. Anderson, both of Kewanee, Ill., assignors to Chromalloy American Corporation, St. Louis, Mo.**

**Filed Jul. 6, 1979, Ser. No. 55,348**
**Int. Cl.³ A01B *35/18***
**U.S. Cl. 172—140** **9 Claims**



**1.** An agricultural implement comprising, in combination,

a generally planar primary frame having front and rear ends and defining a longitudinal axis,

hitch means connected to the front end of said primary frame for enabling said primary frame to be drawn generally in the direction of its longitudinal axis,

a secondary support frame juxtaposed to said primary frame intermediate said front and rear ends thereof, said secondary support frame extending substantially transverse to the longitudinal axis of said primary frame and having a generally planar framework comprising fixedly connected forward and rearward frame members, pairs of laterally spaced parallel links pivotally connected at their opposite ends, respectively, to one of said forward and rearward frame members of said secondary support frame and to said primary frame so as to define at least two parallelogram linkage arrangements interconnecting said one of said frame members to said primary frame, at least one depth control adjusting screw connecting the other of said forward and rearward frame members of said secondary support frame to said primary frame and cooperating with said parallelogram linkage arrangements so as to support said secondary support frame in generally parallel relation to the plane of said primary frame and enable selective adjustment of said secondary support frame relative to said primary frame while maintaining said parallel relation therebetween,

first tool means comprising at least one gang of residue

cutting elements mounted on said secondary support frame for movement therewith relative to said primary frame,

second tool means including a plurality of earth working tools mounted on said primary frame and spaced from said secondary support frame,

and wheel means mounted on said primary frame and selectively adjustable relative to said primary frame to enable raising of said primary frame and said secondary support frame to positions wherein said first and second tool means are raised from the ground for transport of said implement, and to enable lowering of said primary frame and secondary support frame to positions facilitating ground engagement of said first and second tool means.

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**4,313,504**

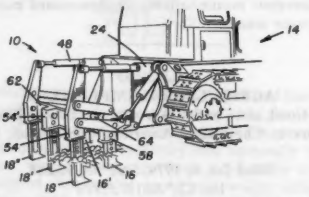
**TANDEM RIPPER ASSEMBLY**

**Robert L. Fischer, New Lenox, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**Filed Aug. 13, 1979, Ser. No. 102,198**

**Int. Cl.³ A01B** *63/118, 13/08;* **E02F** *5/30*

**U.S. Cl. 172—382** **8 Claims**




**1.** A ripper assembly comprising

a first ripper member **(16)**,

a second ripper member **(18)**,

connection means **(20,22,24)** for interconnecting said first **(16)** and second **(18)** ripper members for sequentially (1) lowering said first ripper member **(6)** to a vertical position below said second ripper member **(18)**, and (2) lowering said second ripper member **(18)** to a vertical position below said first ripper member **(16)**,

actuating means **(44)** for moving said connection means generally vertically, and

tilt means **(48)** for tilting the second ripper member **(18)** relative to the connection means **(20,22,24)** and further wherein said connection means **(20,22,24)** is responsive to said tilt means **(48)** for imparting substantially the same tilt to the first ripper member **(16)**.

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**4,313,505**

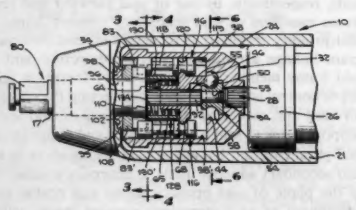
**ROTARY IMPACT CLUTCH**

**David H. Silvern, Los Angeles, Calif., assignor to Rodac Pneumatic Tools, Carson, Calif.**

**Filed Aug. 27, 1979, Ser. No. 70,149**

**Int. Cl.³ B25D** *15/02*

**U.S. Cl. 173—93.5** **8 Claims**




**1.** In an impact clutch of the type embodying parts including a hammer and an anvil, both of which are rotatable about an axis, cylindrical dog pins constructed to have sliding movement with respect to the hammer so that the dog pins come into position to impact against the anvil, cam mechanism having means engageable with the dog pins for imparting the axial movement to the dog pins into the path of rotation of the anvil, the improvement comprising the hammer having arcuate axial grooves in a wall thereof which are open at only one side in which the dog pins are mounted for sliding axial movement and a circular member spaced from said wall separate from said means spaced from said wall and positioned with respect to the dog pins and the member having axial grooves so as to constrain the dog pins to be held in the grooves.

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**4,313,506**

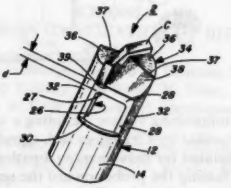
**DRILL CUTTER BIT**

**Thomas L. O'Connell, 9590 Jackson St., Mentor, Ohio 44060**

**Filed Sep. 10, 1980, Ser. No. 186,204**

**Int. Cl.³ E21B** *10/58*

**U.S. Cl. 175—410** **23 Claims**




**1.** A cutter bit for drills having good drilling performance characteristics in relatively soft rock formations as well as in medium and hard rock formations comprising:

a body defined by an elongated shank portion having a bore extending from an open end thereof and a head portion made integral with and extending outwardly from said shank portion

said head portion including a transversely extending slot opening therefrom and adapted to receive a plate-like insert cutter element therein,

said head portion having multiple work surfaces including a first pair of oppositely disposed tapered heel surfaces extending downwardly and outwardly in a direction away from the longitudinal central axis of said bore, a second pair of oppositely disposed tapered compression surfaces extending downwardly and outwardly in a direction away from said longitudinal central axis, said second pair of tapered compression surfaces being disposed at an inclined angle greater than that of said first pair of tapered heel surfaces to progressively reduce drill cuttings to a relatively dust-like consistency,

the respective surfaces of said first pair of tapered heel surfaces being located on opposite sides of said slot, and the respective surfaces of said second pair of tapered compression surfaces being located on opposite sides of said slot, said shank portion having an oppositely disposed pair of dust collection openings disposed below said head portion and in communication with said bore for removing said dust-like material formed during drilling,

said second pair of tapered compression surfaces extending downwardly toward the respective of said dust collection openings, and

said first pair of tapered heel surfaces being generally conical in side elevation and said second pair of tapered compression surfaces being generally planar in side elevation.

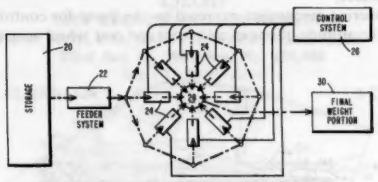
## 4,313,507
## WEIGHT PORTIONING METHOD AND APPARATUS

Gordon W. Hays, P.O. Box 532, Cedar Rapids, Iowa 52406

Continuation of Ser. No. 884,824, Mar. 9, 1978, abandoned, which is a continuation of Ser. No. 679,348, Apr. 22, 1976, abandoned. This application Jul. 3, 1980, Ser. No. 165,570

Int. Cl.³ G01G *13/00*

U.S. Cl. 177—1 12 Claims




1. A method for grouping a population of articles of varying weights into a portion having a weight at least equal to a final target weight comprising the steps of:

determining the average weight of the articles,

forming an initial weight station having an initial target weight smaller than the final target weight by a predetermined amount which is equal to the average weight plus a selected fraction of the average weight,

setting said selected fraction of the average weight so that, as successive groups of articles from the population of articles achieve the initial target weight in said initial weight station, the frequency of occurrence of the weight differences between the actual weights of said successive groups of articles in said initial weight station and the final target weight corresponds to the frequency of occurrence of individual weights of articles in the population of articles,

transporting articles from the population of articles to said initial weight station until the actual weight of the group of articles in said initial weight station is at least equal to the initial target weight,

transporting a number of articles from the population of articles to a plurality of trim scales,

weighing the articles on each of said plurality of trim scales,

selecting articles from said plurality of trim scales having a weight at least equal to and which most closely approximates the difference between the actual weight of the group of articles in said initial weight station and the final target weight, and

combining the articles selected from said plurality of trim scales and the group of articles in said initial weight station to form said portion.

## 4,313,508
## MAIL-WEIGHING MACHINE

Theo Düppre, Kaiserslautern, Fed. Rep. of Germany, assignor to Kuno Sauer, Sulzbach, Fed. Rep. of Germany

Filed Oct. 31, 1979, Ser. No. 90,005

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1978, 2847755

Int. Cl.³ G01G *23/22, 19/52*

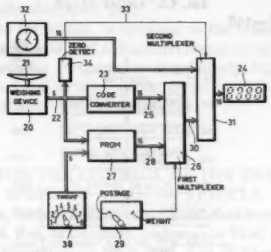
U.S. Cl. 177—25 18 Claims

1. A mail-weighing machine with a weight-measuring device which is connected to a codifier with a digital display device, comprising:

a programmable set-value store containing postage amounts for corresponding different mail weights, the values determined by the weight-measuring device being supplied in digital form to said set-value store, said set-value store thereby producing a digital output signal indicative of the postage amount for the supplied value;

a multiplexer, the codifier and the set-value store being connected with the display device through said multiplexer which alternatively transmits the output signal of the codifier or that of the set-value store to the display device; and

an additional source of information which delivers information to be displayed to the display device and is connected




with an input of a second multiplexer, the output of the first multiplexer being connected with a second input of the second multiplexer, the output of the second multiplexer controlling the display device.

## 4,313,509
## WEIGHING APPARATUS

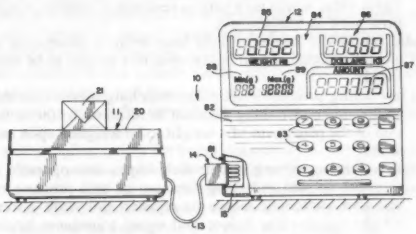
Mathijs M. J. Engels, Koudekerk, Netherlands, assignor to Maatschappij van Berkel's Patent N.V., Leidschendam, Netherlands

Filed Feb. 4, 1980, Ser. No. 118,568

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1979, 2904261

Int. Cl.³ G01G *23/01*

U.S. Cl. 177—50 10 Claims

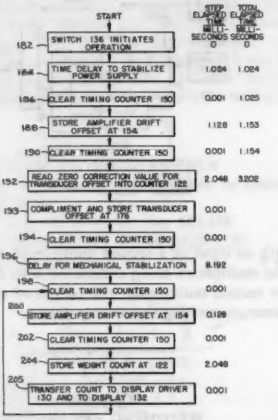



1. In a weighing apparatus for measuring loads and for calculating the value of loads, which apparatus includes a weighing device having an unadjustable movement for producing an electrical signal corresponding to the load being weighed, an evaluating device for digitally reading out the weight of the load and/or the value of the load according to a given value schedule, and cable means permanently connected to the weighing device and detachably connectable to the evaluating device to transmit the electrical weight measuring signals from the weighing device to the evaluating device, the improvement in means for calibrating the movement of provide accurate weight measurements and to enable the weighing device to be used with any evaluating device comprising, a data storage unit, said data storage unit having predetermined constants calibrating the weighing device to cause the unit to produce correct weight measurements when the unit is connected to any evaluating device, and means permanently connecting said data storage unit to cable means of the weighing device.

## 4,313,510
## WEIGHING SCALE WITH DYNAMIC ZERO ERROR CORRECTION

Harold W. Tomlinson, Jr., Liverpool, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Nov. 24, 1980, Ser. No. 209,751
Int. Cl.[3] G01G *13/14*
U.S. Cl. 177—165 10 Claims


START
STEP ELAPSED TIME MILLI-SECONDS
TOTAL ELAPSED TIME MILLI-SECONDS
0
0
182 SWITCH 136 INITIATES OPERATION
184 TIME DELAY TO STABILIZE POWER SUPPLY 1.024 1.024
186 CLEAR TIMING COUNTER 150 0.001 1.025
188 STORE AMPLIFIER DRIFT OFFSET AT 154 1.128 1.153
190 CLEAR TIMING COUNTER 150 0.001 1.154
192 READ ZERO CORRECTION VALUE FOR TRANSDUCER OFFSET INTO COUNTER 122 2.048 3.202
193 COMPLIMENT AND STORE TRANSDUCER OFFSET AT 176 0.001
194 CLEAR TIMING COUNTER 150 0.001
196 DELAY FOR MECHANICAL STABILIZATION 8.192
198 CLEAR TIMING COUNTER 150 0.001
200 STORE AMPLIFIER DRIFT OFFSET AT 154 0.128
202 CLEAR TIMING COUNTER 150 0.001
204 STORE WEIGHT COUNT AT 122 2.048
205 TRANSFER COUNT TO DISPLAY DRIVER 130 AND TO DISPLAY 132 0.001

1. A weighing scale comprising

at least one mechanical-to-electrical signal transducer for sensing a weight to be weighed mechanically and for providing an electrical signal output indicative of a sensed weight,

a weight registering circuit and a weight indicator connected to said transducer,

said transducer being operable to produce a zero weight signal value which may vary in response to ambient conditions such as temperature,

said transducer having a finite time delay in producing an electrical signal output in response to a weight to be measured,

a fast acting pressure responsive switching means operable to provide a switching function in response to the initiation of the placement of a weight to be weighed upon said scale,

said weight registering circuit including means operable in response to said switching function of said pressure responsive switching means to register and store a zero weight signal value before said signal transducer begins sensing the weight to be weighed,

said weight registering circuit then being operable to register the difference between the zero weight signal value and the signal from said transducer while sensing the weight to be weighed for indication as the true weight.

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## 4,313,511
## LAND VEHICLE

Wayne J. Soo Hoo, 4861 N. Paulina, Chicago, Ill. 60640

Filed Sep. 8, 1980, Ser. No. 185,033
Int. Cl.[3] B62D *9/02*
U.S. Cl. 180—21 10 Claims

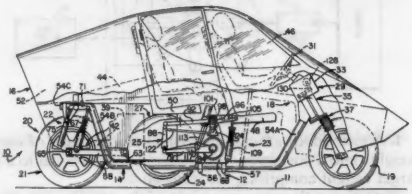
1. In a land vehicle having a body rollably supported above the ground and mounted on a chassis having a frame provided with a plurality of wheels, at least one of which being powered to propel the vehicle along the ground, the arrangement comprising:

a front wheel assembly being mounted on the frame on the longitudinal axis thereof and having a front wheel adapted to roll along the ground;

a rear wheel assembly mounted on the frame on the longitudinal axis thereof spaced from the front wheel assembly and having a rear wheel adapted to roll along the ground in substantially the same track as the front wheel;

a pair of side wheel assemblies being mounted on the frame opposite one another between said front and rear wheel assemblies spaced equally at opposite sides of the longitudinal axis of the frame, and having right and left side wheels adapted to roll along a pair of right and left side tracks;

a steering mechanism mounted on the frame for controlling the attitude of one of said front and rear wheel assemblies



for steering purposes, each one of the remaining wheel assemblies including suspension means, said suspension means including a first outwardly extending suspension arm pivotally connected to said frame and having its wheel mounted rotatably thereon, control means for pushing downwardly on the side wheel assembly suspension arms in response to upwardly directed forces acting on one of said front and rear wheels and alternatively for pushing downwardly on the remaining one of the suspension arms in response to upwardly directed forces acting on said side wheel assemblies.

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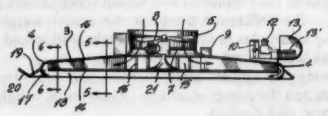
## 4,313,512
## AIR CUSHION VEHICLE

Mario Jutras, 2430 Boulogne Ave., Longueuil, Canada J4L 2J6

Filed Feb. 11, 1980, Ser. No. 120,262
Int. Cl.[3] B60V *1/04, 1/06*
U.S. Cl. 180—117 11 Claims



1. An air cushion vehicle comprising a body shell having an inwardly and downwardly curved peripheral rigid skirt and a top wall, and a plenum chamber open to the surface over which the vehicle rides; further having an upright air inlet funnel mounted on said top wall, open at the top and communicating with the interior of said body shell; a motor-driven fan mounted inside said funnel; an air flow chamber extending from underneath said funnel to the said peripheral skirt and bounded by said top wall and having a horizontal floor which stops short of said peripheral wall, thus defining a peripheral opening, whereby air passes from said air flow chamber to said plenum chamber; said air flow chamber having a plurality of equally spaced-apart vanes radiating outwardly from under the circumferential edge of said funnel and terminating short of said peripheral wall, said vanes defining a plurality of separate channels in said air flow chamber, whereby air turbulence is substantially eliminated and substantially uniform air flow along the periphery of said body shell is obtained, said peripheral skirt being provided with a downwardly, outwardly extending flange, the lower edge of which lies in substantially the

same plane as the bottom edge of said peripheral skirt to provide stability and extra lift to the vehicle.

2. An air cushion vehicle as defined in claim 1, wherein said body shell is in the shape of a rectangle.

3. An air cushion vehicle as defined in claim 2, wherein a longitudinally-oriented propeller is mounted on the said top wall of the vehicle adjacent the aft side of the same.

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**4,313,513**

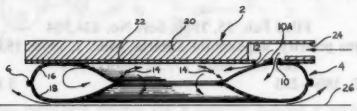
## SELF REGULATING AIR BEARING

**Melvin D. Terry, P.O. Box 7174, Seattle, Wash. 98133**

**Filed Jun. 16, 1980, Ser. No. 159,488**

**Int. Cl.³ B60V** *1/16*

**U.S. Cl. 180—124** **3 Claims**



1. A fluid bearing structure comprising:

a flexible hollow structure having a closed inflatable exterior portion surrounding a central plenum area, said flexible hollow structure including at least one opening in its upper surface to receive fluid under pressure to cause inflation of the hollow structure and at least one other opening to provide communication between the interior of the hollow structure and the plenum;

an overlying, load supporting platform having a substantially flat surface on the lower portion thereof forming an upper boundary of the plenum, said load supporting platform including a conduit for transmitting fluid under pressure, said conduit including a first opening in alignment with the opening in the hollow structure for receiving fluid under pressure and a second opening in communication with the plenum, said second opening being located such that when the bearing is deflated, the upper surface of the hollow structure prevents fluid flow therethrough, preventing pressurization of the plenum until the bearing is partially inflated.

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**4,313,514**

## STEERING APPARATUS FOR VEHICLES

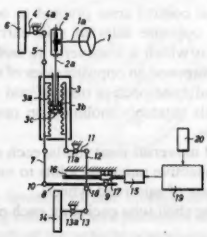
**Yoshimi Furukawa, Tokyo, and Shoichi Sano, Tokorozawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 28, 1979, Ser. No. 107,717**

**Claims priority, application Japan, Dec. 29, 1978, 53/163678**

**Int. Cl.³ B62D** *5/06*

**U.S. Cl. 180—143** **14 Claims**



1. A steering apparatus for a four-wheeled vehicle, comprising:

first means for transmitting steering movement of a steering wheel to front wheels of said vehicle;

second means for transmitting said steering movement to rear wheels of said vehicle;

said first and second means being operable in first directions of operation causing said front and rear wheels to be steered in the same direction, and in second directions of operation causing said front and rear wheels to be steered in opposite directions; and

third means for urging, in response to the relative speed of said vehicle, said first and second means to operate in said first directions of operation at relatively high values of said speed and in said second directions of operation at relatively low values of said speed.

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**4,313,515**

## DEVICE FOR THE CONTROL OF THE TRAVELING SPEED OF A MOTOR VEHICLE

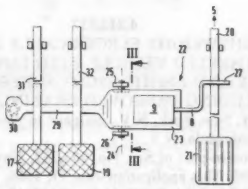
**Arnold Mann, Bieber, and Bernhard Stier, Kelkheim-Fischbach, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Dec. 26, 1979, Ser. No. 107,227**

**Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856294**

**Int. Cl.³ B60K** *31/00*

**U.S. Cl. 180—179** **13 Claims**



1. In a device for the control of the traveling speed of a motor vehicle with an electrical controller which compares the prevailing actual speed with a desired nominal speed and contains a regulating unit electromotorically controlled by the control deviation, which regulating unit is coupled directly or indirectly with an element, which influences the fuel-air mixture supplied to the vehicle motor, the improvement wherein

said regulating unit has a movable part,

coupling means for operatively coupling said movable part with the element,

said coupling means for being operatively connected with a brake pedal and/or a clutch pedal of the vehicle in such a manner that during actuation of the brake pedal and/or the clutch pedal said coupling means is acted on so as to separate the regulating unit from the element,

a spring-biased rocker is operatively connected with the brake pedal and/or the clutch pedal,

said regulating unit is mounted on said rocker,

said movable part of the regulating unit is formed as a rigid bar,

said rigid bar is freely connected with the element.

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**4,313,516**

## AUTOMOBILE SNOW ASSEMBLY

**D. A. Terry, Bayles Lake, Loda, Ill. 60948**

**Filed May 4, 1979, Ser. No. 36,033**

**Int. Cl.³ B62M** *27/02;* **B62D** *55/04*

**U.S. Cl. 180—185** **22 Claims**

1. A snow assembly for conversion for snow operation, of a vehicle which is normally only road operable and having tires mounted on the brake housings of the vehicle, said assembly comprising:

bracket means,

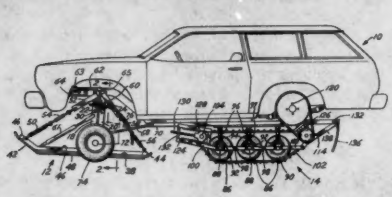
mounting means for mounting said bracket means to one of the vehicle brake housings when its tire is removed and

such that said bracket means extends downwardly from the brake housing;

ski means mounted to said bracket means adjacent the bottom of said bracket means,

track means for driving the vehicle,

a pair of rigid link means pivotally mounted to a least one of



said bracket means and ski means, said link means including attaching means for pivotal attachment of one of said link means to said track means and the other of said link means to the vehicle to rigidly stabilize said bracket means and ski means in the direction of movement of the vehicle and prevent rotation of said bracket means on the brake housing.

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**4,313,517**

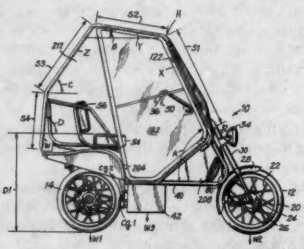
## LIGHTWEIGHT ELECTRICALLY DRIVEN THREE-WHEELED VEHICLE WITH LOW CENTER OF GRAVITY AND LIGHTWEIGHT SUPERSTRUCTURE INCLUDING IMPROVED BRAKING SYSTEM

**Stuart Pivar, New York, N.Y., assignor to American Microcar, Inc., Farmingdale, N.Y.**

**Continuation-in-part of Ser. No. 963,282, Nov. 24, 1978, Pat. No. 4,237,995. This application Jan. 11, 1980, Ser. No. 111,199**

**Int. Cl.³ B60L** *7/24;* **B62D** *61/06;* **B62J** *17/00;* **B62M** *7/04*

**U.S. Cl. 180—216** **31 Claims**



1. A vehicle comprising frame means adapted to support at least one passenger, a source of power, three wheels on and supporting said frame means for ground traversing movement, an electric motor coupled to and driving at least one of said wheels and being coupled to and driven by said source of power, said source of power being located relatively low in said vehicle and constituting a substantial portion of the weight of the vehicle whereby to define for said vehicle a relatively low center of gravity, said wheels defining respective axes of rotation and said center of gravity being substantially no higher than said axes, the source of power including a battery pack having a weight of at least about one hundred pounds, braking means for braking said vehicle inclusive of the weight of said battery pack, said braking means including mechanical and electromagnetic brakes cooperatively operable, a braking light, and a braking light circuit coupled to said light to supply electrical current to the light for operating the same when said braking means is operated, said braking means including means at least partly constituting said electromagnetic brakes for electromagnetically braking said vehicle by the use of said current and steering means coupled to one of said wheels and including a yoke with two handles, said braking means including levers on said handles to control said mechanical brakes and rotary members on said handles to selectively actuate said batteries and electro-magnetic brakes.

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**4,313,518**

## FRAME, POWER TRAIN AND WHEEL ASSEMBLY

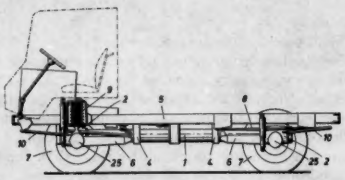
**Erich Ledwinka, and Milan Cvetnic, both Graz, Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria**

**Filed Feb. 25, 1980, Ser. No. 124,514**

**Claims priority, application Austria, Mar. 1, 1979, 1532/79**

**Int. Cl.³ B60K** *17/30;* **B60G** *3/14*

**U.S. Cl. 180—233** **3 Claims**



1. A frame, power train and wheel assembly for an all-wheel drive motor vehicle, comprising

a longitudinal carrying tube,

a rotatable propeller shaft extending in said carrying tube along the same,

body supports comprising two cross members spaced apart along and secured to said carrying tube, and two longitudinal members extending on opposite sides of and parallel to said carrying tube and secured to said cross members,

two axle assemblies spaced apart along said carrying tube, and

two spur gear differentials operatively connecting said propeller shaft to respective ones of said axle assemblies,

each of said axle assemblies comprising

a gear housing flanged to said carrying tube,

first and second bevel pinions spaced apart along and rotatably mounted on a hollow tube in said gear housing and meshing with said differential,

first and second crown wheels disposed on opposite sides of said hollow tube and rotatably mounted in said gear housing and in mesh with said first and second bevel pinions, respectively,

two longitudinal control arms pivoted to one of said cross members on opposite sides of said carrying tube on a horizontal axis which is transverse to said carrying tube,

two stub axles disposed on opposite sides of said hollow tube and connected to respective ones of said control arms,

two road wheels rotatably mounted on respective ones of said stub axles,

first and second universal-joint shafts, each of which is connected by respective universal joints to one of said crown wheels and one of said road wheels,

a splash proofing shell tube enclosing each of said universal-joint shafts,

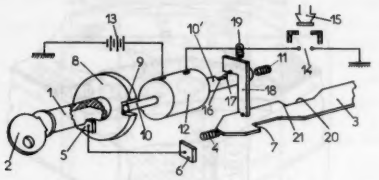
ball-type joints connecting each of said shell tubes to the adjacent stub axle and to the adjacent gear housing, respectively, and

an axially yieldable annular seal wherein each of said shell tubes is mounted.

## 4,313,519
## VEHICLE SAFETY LOCK

Paul Lipschutz, Croissy, France, assignor to Neiman S.A., Courbevoie, France

Filed Jan. 5, 1979, Ser. No. 1,135
Claims priority, application France, Jan. 17, 1978, 78 01155
Int. Cl.³ B60R *25/00*
U.S. Cl. 180—270 4 Claims




1. An anti-theft device for a vehicle having a safety belt incorporating a buckle having cooperating fixed and movable parts, comprising:

(a) a cylinder lock operated by a key and movable between a "parked" position to another position for control of the vehicle engine,

(b) a bolt controlled by said cylinder lock for locking an element essential to the driving of the vehicle,

(c) a plate attached to said cylinder lock for rotation therewith, and having an aperture therein,

(d) a plunger capable of entering said aperture only when said cylinder lock is in the "parked" position where the aperture is opposite to said plunger to effect locking of said plate and hence said cylinder,

(e) spring means for urging said plunger in a direction to effect entry thereof into said aperture,

(f) actuating means controlled by the buckle of said safety belt for effecting withdrawal of said plunger from said aperture to a retracted position when said safety belt is fastened within said buckle,

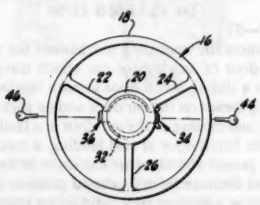
(g) a security blade controlled by said bolt, and

(h) further spring means to thrust said blade towards the said plunger, which comprises a notch which, in the retracted position, is opposite to said blade.

## 4,313,520
## AUTOMOBILE IGNITION CIRCUIT CLOSING DEVICE

Lowell G. Chester, 713 Trancas St. #10, Napa, Calif. 94558

Filed May 21, 1979, Ser. No. 40,842
Int. Cl.³ B60R *25/04;* H01H *27/00;* B60R *16/04*
U.S. Cl. 180—287 3 Claims




1. A vehicle ignition circuit closing device for a vehicle having a steering column with a portion of the steering column located in the cab of the vehicle comprising:

a. first key operated locking ignition switch being located on one side of the steering column portion within the cab of the vehicle;

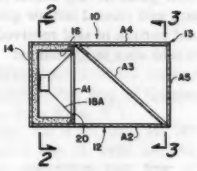
b. second key operated locking ignition switch being located on the other side of the steering column within the cab of the vehicle, said first and second key operated locking ignition switches including first and second key openings which are located on said one and another side of the steering column respectively;

c. source of electrical energy, said first and second key operated ignition switches being electrically connected in parallel to said source of electrical energy and to the ignition circuit of an automobile.

## 4,313,521
## SPEAKER HOUSING

M. Raymond Rodden, 4917 S. Braden Apt. 11F, Tulsa, Okla. 74135

Filed Jun. 16, 1980, Ser. No. 159,790
Int. Cl.³ H05K *5/00*
U.S. Cl. 181—145 10 Claims




1. A loud speaker housing or cabinet, comprising;

(a) a closed chamber in the form of a first rectangular right prism, having a first wall with its two opposite edges attached to spaced, parallel, second and fourth walls, and a third wall parallel to said first wall and attached at its edges to said second and fourth wall;

(b) a divider wall positioned diagonally inside said four walls from one edge of said first wall to the opposite edge of said third wall;

(c) at least one opening in said first wall and a sound source positioned outside said chamber over said opening, facing toward said divider wall;

(d) a tapered opening in said divider wall of expanding exponential shape, the tapered end of said opening closest to said sound source, and the wider end farthest from said source;

whereby said sound energy is directed into a first of two triangular prismatic volumes, and passes through said opening in said divider into a second identical volume;

(e) side walls covering across the edges of four walls, fully enclose said two volumes; and

(f) at least a portion of at least one of said four surfaces enclosing said second triangular prismatic volume open, to permit issuance of sound energy from said second triangular prismatic volume.

## 4,313,522
## STATIC PRESSURE REGAIN COUPLER FOR AN AIR DISTRIBUTION SYSTEM

Dimiter Gorchev, Boston, Mass., and Karl U. Ingard, Kittery Point, Me., assignors to Mitco Corporation, Somerville, Mass.

Continuation-in-part of Ser. No. 944,133, Sep. 20, 1978, Pat. No. 4,182,430. This application Sep. 10, 1979, Ser. No. 73,604
Int. Cl.³ E04F *17/04*
U.S. Cl. 181—224 11 Claims

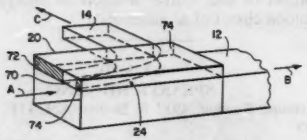
1. Apparatus for coupling an airstream from an input duct to an output duct and at least one associated channel, comprising:

A. an input port having a cross-section substantially the same as the cross-section of said input duct and adapted to receive substantially all the air in said airstream,

B. an output port having a cross-section including at least two parts, the first of said parts having a substantially the same cross-section at its downstream end as said output duct and the second of said parts having substantially the

same cross-section at its downstream end as said associated channel, wherein said second part is contiguous to said first part,

C. a first airflow guide having lateral side walls defining said first part, said first airflow guide being adapted to pass a




first portion of said received air through said first part to said output duct,

D. a second airflow guide having lateral side walls defining said second part, said second airflow guide being adapted to pass a second portion of said received air through said second part to said associated channel.

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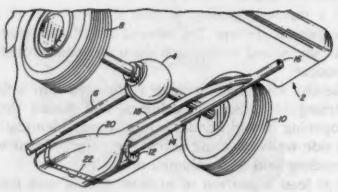
**4,313,523**

## AUTOMOTIVE EXHAUST SYSTEM INCORPORATING VENTURI TO REDUCE BACK PRESSURE

**Dennis E. Copen, 11235 N. 15th St., Phoenix, Ariz. 85020**

**Filed Jun. 23, 1980, Ser. No. 162,125**
**Int. Cl.³ F01N *1/14***
**U.S. Cl. 181—263** **7 Claims**



1. An apparatus for modifying an exhaust system of a vehicle to reduce back pressure associated therewith, said exhaust system including a tailpipe having an outlet end, said apparatus comprising in combination:

(a) a pipe having first and second ends;

(b) means for forcing air into the first end of said pipe;

(c) a coupling member having a tubular inlet portion coupled to the second end of said pipe for receiving forced air and having a semi-cylindrical outlet portion for abutting the tailpipe of the exhaust system and for discharging the forced air received by said tubular inlet portion; and

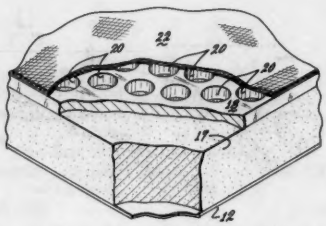
(d) means for securing said semi-cylindrical outlet portion of said coupling member in abutting relationship with the tailpipe of the exhaust system and in overlying relationship with a hole formed within the tailpipe near the outlet end thereof for creating a venturi within the tailpipe and for injecting forced air discharged by said semi-cylindrical outlet portion of said coupling member into the tailpipe toward the outlet end thereof in order to create suction within the tailpipe for drawing exhaust gases away from the exhaust system.

**4,313,524**

## BULK ACOUSTIC ABSORBER PANELS FOR USE IN HIGH SPEED GAS FLOW ENVIRONMENTS

**Philip M. Rose, Chula Vista, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.**

**Filed Dec. 17, 1980, Ser. No. 217,209**
**Int. Cl.³ E04B *1/82*; F01N *1/24***
**U.S. Cl. 181—291** **5 Claims**




1. A structurally efficient acoustic absorber panels comprising:

a rigid open base member which comprises a back plate, end and side walls;

acoustic absorber means disposed within the opening of said rigid base member;

a rigid perforated plate is attached to said end and side walls for forming a cover for said opening of said rigid base member for enclosing said acoustic absorber means, the perforations of said perforated sheet are sufficient in number and cross-section to provide a large actual open area therethrough; and

a layer of fine woven wire cloth material is adhered by adhesive means to the outer surface of said perforated sheet, the pores through said sheet of said wire cloth material provide a pre-determined flow through resistance through the combined perforated sheet and layer of wire cloth material,

whereby a high speed gas flow across said layer of fine woven wire cloth material encounters a minimum of surface resistance, and provides a high degree of sound absorbtion while substantially impervious to water, dust, chemical and various other contaminants.

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**4,313,525**

## CAR DOOR SAFETY INTERLOCK

**Emory W. McDonald, Geneseo, Ill., assignor to Montgomery Elevator Company, Moline, Ill.**

**Filed Jun. 5, 1980, Ser. No. 156,771**
**Int. Cl.³ B66B *13/00***
**U.S. Cl. 187—57** **8 Claims**

1. In an automatic operating mechanism for a power operated sliding door of an elevator car which travels in a hatchway that has a sliding hatch door at each landing, there being interengaging means on the car door and on each hatch door so that opening and closing of the car door at a landing also opens and closes the hatch door at said landing, a mechanical safety interlock to permit the elevator car door to be moved more than a critical distance from its closed position only when the elevator car is in a landing zone, said safety interlock comprising, in combination:

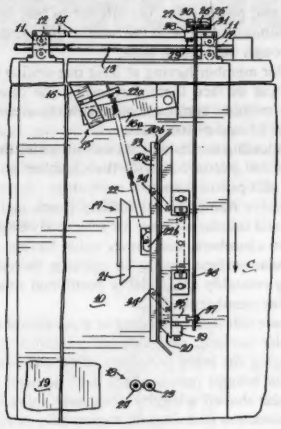
a fixed interlock lug on the car frame above the car door;

an interlock hook pivotally mounted on the car door, said hook having a normal position when the car door is closed in which a lug engaging portion thereof is aligned with said lug and spaced from the lug by said critical distance;

a movable element on the car door which operatively engages the interlock hook so that movement of said element moves said hook from said normal position to a clearance

position in which its lug engaging portion is out of alignment with the interlock lug;

and element driving means mounted on the car door in a position to contact the interengaging means on a hatch door when the car door has moved part of said critical distance, said element driving means being thereafter



moved by said contact with said interengaging means to move said element and thereby move the hook to its clearance position before the car door moves the rest of the critical distance, whereby the car door can be moved more than said critical distance only when the car is in a landing zone.

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**4,313,526**

**DISC BRAKE CALIPER HAVING A SLIDING CYLINDER**

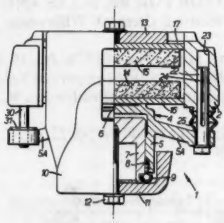
**Glyn P. R. Farr, Warwich, England, assignor to Lucas Industries Limited, Birmingham, England**

**Filed Jan. 15, 1980, Ser. No. 112,361**

**Claims priority, application United Kingdom, Jan. 18, 1979, 01915/79**

**Int. Cl.³ F16D *55/224***

**U.S. Cl. 188—72.4** **4 Claims**



1. In a disc brake assembly comprising:

(a) a carrier member adapted to be mounted in a fixed position adjacent a brake disc and including portions spanning the periphery of the brake disc;

(b) a hydraulic cylinder slidably mounted on the carrier member on one side of the brake disc, the cylinder being closed at the end thereof adjacent the brake disc by an end wall;

(c) a piston slidably mounted in the cyliner;

(d) a first brake pad slidably mounted on the carrier member between the disc and said end wall of said cylinder;

(e) a second brake pad slidably mounted on the carrier member on the opposite side of the disc to the first brake pad; and

(f) a bridge member for transmitting actuating force from said piston to said second brake pad

the improvement comprising said bridge member being an integral unitary member of generally U-shaped transverse cross-section with the central portion of said U-shape overlying said brake pads, the bridge member being retained in operative position solely by first releasable fastener means securing the bridge member to the piston and by a spring secured to the bridge member adjacent said second brake pad and slidably engaging radially inwardly directed surfaces of said carrier member.

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**4,313,527**

**BRAKE SHOE SECURING ARRANGEMENT**

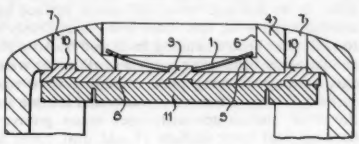
**Hajo Pickel, Kelkheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.**

**Continuation of Ser. No. 3,177, Jan. 15, 1979, abandoned. This application Apr. 21, 1980, Ser. No. 142,528**

**Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804619**

**Int. Cl.³ F16D *65/04***

**U.S. Cl. 188—73.32** **7 Claims**



1. An arrangement to secure a brake shoe in a caliper of a disc brake comprising:

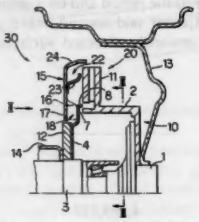
a cylindrical lug formed in the center of, extending outwardly from and perpendicular to one surface of a pad carrier plate of said brake shoe during the manufacture of said pad carrier plate, said one surface of said pad carrier plate being parallel to the other surface of said pad carrier plate upon which a pad of said brake shoe is secured, said one surface of said pad carrier plate being disposed adjacent an open end of a central circular opening of said caliper coaxial of a central longitudinal axis of said central opening, said lug being coaxial with said axis and extending into said central opening, said central opening having a bearing surface spaced inwardly from said open end within said central opening coaxial of said axis and a given distance from and parallel to said one surface of said pad carrier plate; and

a rectangular spring plate having an elongated slot disposed in the center thereof parallel to and substantially coextensive with its long dimension, said slot having an arcuate recess in each edge of said slot in the middle thereof to engage the outer surface of said lug in a locking manner adjacent said one surface, and opposite ends of said long dimension of said spring plate engage said bearing surface, said lug having a height less than said given distance and said spring plate is bent in a concave manner looking out of said central opening toward said lug in said long dimension from said bearing surface toward said one surface of said pad carrier plate when said spring plate is locked on said outer surface of said lug to ensure a safe locking of said spring plate on said lug in both the long and short dimension of said spring plate.

## 4,313,528
## WATER PREVENTING STRUCTURE IN A DRUM-IN-DISC BRAKE

Sadayoshi Ito, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 19, 1980, Ser. No. 122,703
Claims priority, application Japan, Feb. 27, 1979, 54-24805[U]
Int. Cl.³ F16D 65/04
U.S. Cl. 188—218 A 8 Claims



1. A drum-in-disc brake comprising:
a cylindrical brake drum;
a disc rotor extending from the outer periphery of said brake drum, said disc rotor comprising in part a friction surface;
a caliper assembly mounted adjacent said disc rotor;
an annular backing plate covering one end of said brake drum, an outer brim extending from said backing plate's outer periphery, and;
a dust cover comprising an inside surface which faces said brake drum and said rotor, said inside surface having an annular inner brim, said inner brim being firmly attached to said outer brim extending from said backing plate, said annular inner brim being gapped to allow for water drainage, a water carrying plate extending from said inside surface of said dust cover towards said friction surface of the rotor, and an upwardly open water groove formed between said inner surface of said dust cover and said water carrying plate.

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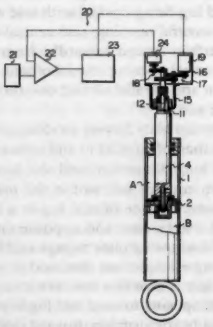
## 4,313,529
## HYDRAULIC DAMPER

Tetuo Kato, Yokohama; Tamio Uemura, and Yoshiki Kodama, both of Kawasaki, all of Japan, assignors to Tokico Ltd., Kawasaka, Japan

Filed Nov. 5, 1979, Ser. No. 91,495
Claims priority, application Japan, Nov. 10, 1978, 53-138600
Int. Cl.³ F16F 9/46
U.S. Cl. 188—299 7 Claims



1. A hydraulic damper comprising:
a cylinder having opposite closed ends for containing hydraulic fluid.
a piston having two sides and a bore therethrough, said piston being positioned within the interior of said cylinder and being slidable in the direction of the longitudinal axis of said cylinder, the interior of said cylinder being divided into two chambers by said piston;
a tubular member connected to a first one of said piston sides;
a hollow piston rod connected to said piston on the second one of said piston sides, the interior of said hollow piston rod communicating with the interior of said tubular member through said piston bore;
said tubular member having at least one orifice through the cylindrical surface thereof whereby the interior of said tubular member communicates with the chamber on said first one of said piston sides;
a communicating means which communicates the interior of said hollow piston rod with the chamber on the second one of said piston sides;
a rotary valve rotatably and slidably positioned in the interior of said tubular member for selectively communicating said two chambers, said rotary valve having:
an annular surface having an opening therethrough and being rotatably and slidably positioned relative to said tubular member; and
an arcuate sidewall connected to a peripheral edge of said annular surface, said sidewall rotatably and slidably engaging the inner periphery of the cylindrical surface of said tubular member, and said sidewall being semicircular shaped whereby when said valve is rotated in one direction said sidewall sequentially covers a portion or all of said orifice and thereby limits the communication between said two chambers, and when said valve is rotated in the other direction said sidewall sequentially uncovers a portion or all of said orifice and thereby expands the communication between said two chambers;
an elongated stem extended through the interior of said hollow piston rod and being fixedly connected to said valve, a portion of said stem extending outwardly from one of said cylinder ends;
a motor with a rotating element connected to said outwardly extending stem portion for rotating said stem and thereby rotating said valve, and
a control means connected to said motor and which controls a motor rotating element and thereby controls the selective communicating between said two chambers.

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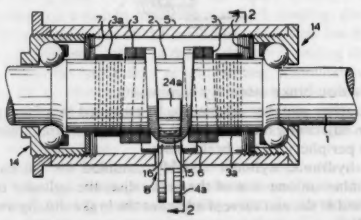
## 4,313,530
## BRAKE ACTUATOR FOR BICYCLES AND THE LIKE

Winnett Boyd, 32 Restwell Crescent, Willowdale, Ontario, Canada M2K 2A3

Continuation-in-part of Ser. No. 815,921, Jul. 15, 1977, Pat. No. 4,199,046, which is a continuation-in-part of Ser. No. 763,653, Jan. 28, 1977, abandoned. This application Jan. 8, 1980, Ser. No. 110,494
Int. Cl.³ B60K 41/20, 13/08
U.S. Cl. 192—41 S 13 Claims



1. In a device for operating a brake of a pedal operated vehicle which device comprises a brake operating lever projecting through an opening in a pedal crankshaft housing of the vehicle, the lever being connected to a bight connecting two

spring coils which concentrically surround and frictionally engage a pedal crankshaft within the housing.

the improvement wherein the lever comprises a yoke engaging said bight and surrounding part of the circumference of the crankshaft, and is so dimensioned that in its plane of operation it has no dimension greater than the internal diameter of the pedal crankshaft housing but when the yoke partially surrounds the crankshaft an arm of the lever projects through the opening in the housing beyond its outer surface.

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**4,313,531**

## VISCOUS FLUID COUPLING

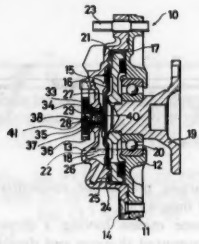
**Takanobu Hori, and Masaharu Hayashi, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Filed Jan. 3, 1980, Ser. No. 109,194**

**Claims priority, application Japan, Feb. 8, 1979, 54-15710**

**Int. Cl.³ F16D *43/25, 35/00***

**U.S. Cl. 192—58 B** **6 Claims**



1. A viscous fluid coupling comprising:

a rotatable casing provided with a fluid operating chamber and a fluid reservoir chamber therein and having an axial opening formed in said casing;

a rotor located in said fluid operating chamber and rotatable relative to said casing;

a valve shaft rotatably received in said axial opening formed in said casing;

a valve member fixed to an inner end of said valve shaft and operable to control fluid communication between said fluid operating chamber and said fluid reservoir chamber;

a bimetal coil located on an exterior portion of said casing, said bimetal coil being connected at inner and outer ends thereof to said valve shaft and said casing, respectively;

said valve shaft comprising a first end portion connected to said coil and a second end portion opposite said first end portion having a uniform diameter;

said second end portion of said shaft comprising a plurality of annular grooves formed therein; and

a plurality of sealing rings disposed within said annular grooves and axially spaced and interposed between the outer periphery of said valve shaft and a wall of said opening such that said sealing rings receive the entire radial load placed upon said shaft and wherein said sealing rings comprise a resilient material.

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**4,313,532**

## DRIVING ARRANGEMENT WITH A FRICTION CLUTCH

**Wolfgang Angersbach, and Rudolf Kling, both of Darmstadt, Fed. Rep. of Germany, assignors to Quick-Rotan Elektromotoren GmbH, Darmstadt, Fed. Rep. of Germany**

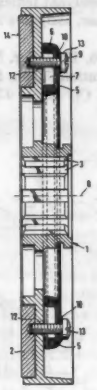
**Filed Aug. 1, 1979, Ser. No. 62,899**

**Claims priority, application Fed. Rep. of Germany, Aug. 11, 1978, 2835300**

**Int. Cl.³ F16D *13/74***

**U.S. Cl. 192—113 B** **13 Claims**

1. A driving arrangement with a friction clutch for transmitting of a starting moment and/or a braking moment to a shaft to be driven or braked, comprising at least one clutch element arranged to transmit torque and formed as a disc having an axis; a ring-shaped friction member arranged on said clutch element coaxial to the latter and forming a friction face; at least one lubricant storing means carried by said clutch element and arranged for accommodating a lubricating medium and distributing the latter over said friction face of said friction member; and means for mounting said lubricant storing means on said clutch element and including a plurality of threaded members



which extend through said lubricant storing means and thereby through the lubricating medium accommodated therein, and engage in said friction member, so that the lubricating medium flows from said lubricant storing means to said friction face along the thread of said threaded members, whereby said threaded members form means for simultaneously mounting said lubricant storing means and guiding the lubricating medium.

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**4,313,533**

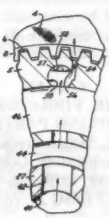
## INTERLEAVED FRICTION PLATE TYPE CLUTCH HAVING CLUTCH COOLING PASSAGE MEANS INCLUDING A RESERVOIR, WEIR AND SLOT

**George R. Aschauer, Racine, Wis., assignor to Twin Disc, Incorporated, Racine, Wis.**

**Filed May 12, 1980, Ser. No. 148,948**

**Int. Cl.³ F16D *13/74***

**U.S. Cl. 192—113 B** **9 Claims**



1. An interleaved, friction plate type clutch comprising interleaved clutch plates adapted to be axially and releasably clamped together for engagement of said clutch, and a series of circumferentially spaced, cooling fluid passage means in said clutch and being in fluid communication with said clutch plates, each of said passage means including an axially extending reservoir having a generally co-extensive axially extending slot which intersects said reservoir at one side thereof so as to define a fluid weir at the juncture of said reservoir and said slot, said weir extending radially inwardly from said reservoir

whereby fluid can flow from a generally central portion of said clutch to fill said reservoir and be held therein by centrifugal force and then flows over said weir and into said slot along the axial length thereof to cover said clutch plates.

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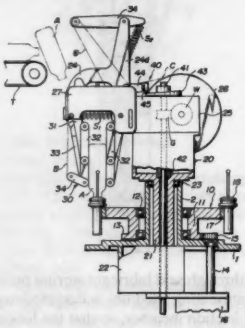
## 4,313,534
## DEVICE FOR UNLOADING BOTTLE-SHAPED CONTAINERS

**Sadao Suzuki, Tokyo; Yoshiyuki Ichizawa, Sohka, and Nobuichi Seki, Tokyo, all of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan**

**Filed Dec. 6, 1979, Ser. No. 100,913**
**Claims priority, application Japan, Dec. 28, 1978, 53-162045**
**Int. Cl.³ B65G *47/34***
**U.S. Cl. 198—484** **6 Claims**



1. A device for unloading bottle-shaped containers comprising:

turning means rotating at constant speed around a center thereof for holding a plurality of jigs for holding respectively bottle-shaped containers, at equal central angle interval at the peripheral end thereof,

rocking means so assembled concentrically with said turning means as to ride on said turning means and to turn at the same speed in the same direction as said turning means within predetermined angle and then to return to the original position at a speed faster than the speed of said turning means, and

a pair of linking mechanisms supported by a supporting arm, having front and rear portions, projected from said rocking means at the position directly above the jigs for radially grasping to hold the bottle-shaped containers engaged by the jigs located between said linking mechanisms to unload the container from the jig.

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## 4,313,535
## EXCITED FRAME, VIBRATORY CONVEYING APPARATUS FOR MOVING PARTICULATE MATERIAL

**Dumont M. Carmichael, Milton-Freewater, Oreg., assignor to Applied Magnetics Corporation, Goleta, Calif.**

**Filed Jun. 15, 1979, Ser. No. 48,728**
**Int. Cl.³ B65G *27/16, 27/08***
**U.S. Cl. 198—766** **5 Claims**

1. An excited frame, vibratory conveying apparatus for moving particulate material, comprising:

an excited frame means having an elongated frame extending in an intended conveying direction defining a first part of an assembly;

said excited frame means having a known center of mass;

an elongated conveying member supported on the elongated frame and extending in the intended conveying direction and defining a second part of the assembly for receiving particulate material at one end and conveying the particulate material in a forward direction to an opposite end;

said elongated conveying member having a known center of mass;

first supporting means for resiliently supporting the conveying member on the excited frame means and defining a third part of the assembly to enable the elongated conveying member to reciprocate in the intended conveying direction with respect to the elongated frame;

said first supporting means comprising a plurality of springs connected to and extending between the elongated frame and the conveying member for resiliently supporting the conveying member on the elongated frame to enable the conveying member on the elongated frame to enable the conveying member to reciprocate in a prescribed path in the intended conveying direction with the conveying member forward and upward in a forward stroke and rearward and downward in a rearward stroke with respect to the excited frame means;

said springs having a known spring constant and wherein said assembly has a known weight and center of mass;

a second supporting means for resiliently supporting the excited frame means;

said excited frame means having a directional vibratory drive means mounted thereon and directly connected to the elongated frame in which the directional vibratory drive means produces vibrating motion along a linear line of force for directly vibrating the elongated frame at a desired frequency relating to the weight of the assembly and spring constant;

said excited frame means having a mounting means mounting the vibratory drive means on the elongated frame with the linear line of force extending colinearly through the center of masses of the excited frame means and the conveying member and parallel with the prescribed reciprocating path of the conveying member to minimize rocking motion of the conveying element about its center of mass; and

said vibratory drive means being mounted along the line of force spaced from the center of mass of the assembly.

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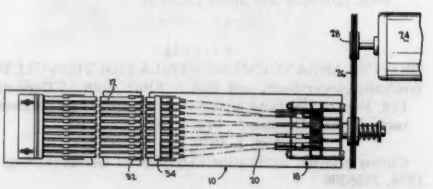
## 4,313,536
## CONVEYOR AND CONTROL THEREFOR

**Frederick E. Fauth, Towson, Md., assignor to American Bottlers Equipment Co., Inc., Owings Mills, Md.**

**Filed Mar. 21, 1980, Ser. No. 132,683**
**Int. Cl.³ B65G *13/06***
**U.S. Cl. 198—781** **27 Claims**



1. A transfer mechanism for transporting articles, comprising:

(a) a plurality of parallel rollers disposed in a planar array and forming a conveyor;

(b) means for supporting said rollers for rotation; and
(c) means for driving said rollers, said drive means comprising:
(d) an input drive means having a drive transmitting surface;
(e) a plurality of drive takeoff members disposed in a circular array around the periphery of, and driven by, said drive means;
(f) a flexible coupling connecting each of said rollers with one of said takeoff members, whereby rotation of said takeoff members causes rotation of said rollers; and
(g) means for driving said input drive means,
(h) adjustable torque clutch means operatively interposed between said last mentioned driving means and said input drive means.

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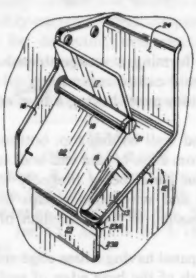
4,313,537

## DEVICE FOR HOLDING, DRYING AND REPETITIVELY DISPENSING A BAR OF SOAP

Theodore D. A. Collet, 6140 Calle Tuberia, Scottsdale, Ariz. 85251

Continuation of Ser. No. 41,528, May 22, 1979. This application Aug. 13, 1979, Ser. No. 66,186
Int. Cl.[3] A47K *5/08*
U.S. Cl. 206—77.1 8 Claims



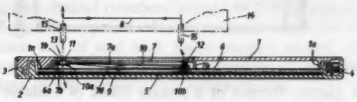
1. A device for repetitively dispensing the same bar of soap comprising:
a support,
a pair of relatively thin elongated members spacedly arranged to extend laterally from said support member to define between them an elongated trough for receiving at its upper end the bar of soap,
one of said members being pivotally mounted relative to said other member on said support for engaging said other member at their common other ends to hold the bar of soap in said trough,
whereby when a bar of soap is in said trough, an oblique component of its mass is applied to said one of said members substantially parallel to the surface of the other of said members developing a slight torque on said one of said members about its pivotal mounting,
the other of said members being fixed, positioned below said one of said members and supporting said bar of soap, and
means forming a part of said other end of said one of said members for engagement by a user for pivoting it away from said other member to cause the bar of soap in said trough to be dislodged and fall into the hand of the user.

4,313,538

## FILM CASSETTE WITH AN OPENING FOR EXPOSING DATA ON A FILM ACCOMMODATED THEREIN

Walter Bauer, and Heinrich Färber, both of Munich, Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 24, 1980, Ser. No. 162,523
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1979, 2925837
Int. Cl.[3] B65D *81/30;* H05G *1/28;* G03B *41/16*
U.S. Cl. 206—455 12 Claims



1. A film cassette, particularly an X-ray film cassette, comprising a housing bounding a compartment for accommodating a film and having an opening for exposing an image on a predetermined portion of the film in said compartment; and means for light-tightly closing said opening, including a closure mounted in said housing for displacement between a closed position of covering, and an open position of clearing, said opening, and having an access aperture therethrough, and a latching member mounted on said closure behind said access aperture for movement between a latching position in which one portion thereof latchingly engages said housing and another portion thereof light-tightly covers said access aperture and a releasing position in which said one portion thereof is disengaged from said housing, said latching member being biased toward said latching position, and said access aperture providing access to said other portion of said latching member for an actuating pin to enable the latter to move said latching member toward said releasing position thereof.

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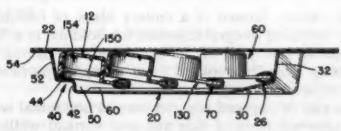
4,313,539

## ADDITIVE CAP AND PACKAGE THEREFOR

Kenneth Raines, Bethlehem, Pa., assignor to Burron Medical Inc., Bethlehem, Pa.

Filed Jun. 16, 1980, Ser. No. 159,663
Int. Cl.[3] B65D *83/00, 65/16*
U.S. Cl. 206—461 12 Claims



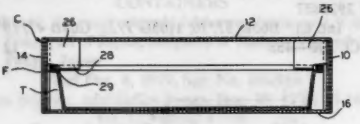

1. A closure means for closing solution bottles in an aseptic manner comprising:
a blister package;
a plurality of cap retainer members in said package;
a plurality of caps on each retainer member, each cap including a hinge portion defined by tear away joints and a living joint and a clamping fin attached to said hinge portion, said clamping fin being releasably held by said each retainer member.

**4,313,540**

## CARTON WITH ARTICLE RETAINING STRUCTURE

**Joseph J. Hart, and John D. Desmond, both of Philadelphia, Pa., assignors to Container Corporation of America, Chicago, Ill.**

**Filed Jul. 21, 1980, Ser. No. 170,724**
**Int. Cl.³ B65D** *5/50, 85/30, 5/06*
**U.S. Cl. 206—588** **3 Claims**




1. A carton, formed of a unitary blank of foldable paperboard, including intergral structure for holding in a fixed position, a generally rectangular tray having a flange projecting laterally outward from an upper portion thereof, said carton comprising:

(a) a pair of opposed top and bottom horizontal walls;

(b) opposed pairs of side and end vertical walls foldably joined to each other on first fold lines and to said horizontal walls on second fold lines, which extend normal to said first fold lines, to define a box-like enclosure; and

(c) retaining panels foldably joined to opposite ends of said opposed end vertical walls, each of said retaining panels having at its outer end a downwardly extending projection and at its inner end a recessed shoulder to provide an abutment in which the shoulder receives the upper portion of a flange of a tray, and the projection extends downwardly against the top of the tray and inboardly of the flange to hold the tray in a fixed position against said bottom wall.

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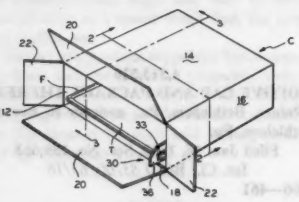
**4,313,541**

## CARTON WITH ARTICLE RETAINING STRUCTURE

**Joseph J. Hart, and John D. Desmond, both of Philadelphia, Pa., assignors to Container Corporation of America, Chicago, Ill.**

**Filed Jul. 21, 1980, Ser. No. 170,895**
**Int. Cl.³ B65D** *5/06, 85/30*
**U.S. Cl. 206—588** **2 Claims**




1. A carton, formed of a unitary blank of foldable paperboard, including integral structure for holding, in a fixed position against one wall of the carton, a tray having a flange projecting laterally outward from an upper portion thereof, said carton comprising:

(a) a pair of opposed top and bottom horizontal walls;

(b) opposed pairs of side and end vertical walls foldably joined to each other on first fold lines and to said horizontal walls on second fold lines, which extend normal to said first fold lines, to define a box-like enclosure;

(c) a glue flap foldably joined to one of said opposed top and bottom walls;

(d) a retaining panel foldably joined to said glue flap and extending parallel to but spaced inwardly to one of said pairs of side walls, said retaining panel having a laterally extending opening to receive a portion of the outer flange of a tray and a lock tab extending downwardly against the upper portion of the tray at a right angle to said horizontal walls to hold said tray in a fixed position against said bottom wall.

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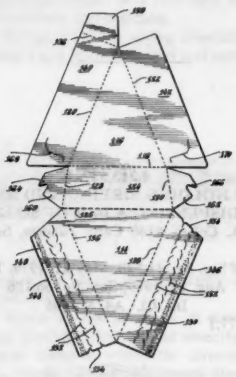
**4,313,542**

## SINGLE-SERVING PIE CARTON AND BLANK

**Harry H. Roberts, Roswell, Ga., and Raymond A. Cote, Taylorville, N.C., assignors to Champion International Corporation, Stamford, Conn.**

**Continuation of Ser. No. 57,164, Jul. 13, 1979, abandoned. This application Jun. 19, 1980, Ser. No. 161,027**
**Int. Cl.³ B65D** *5/54*
**U.S. Cl. 206—611** **5 Claims**



1. A blank for forming a wedge-shaped carton having a slanted end wall, said carton comprising:

a triangular bottom panel having a base edge and two side edges;

a trapezoidal end wall having top, bottom and side edges, with said bottom edge of said end wall and said base edge of said bottom panel being hingedly connected and of equal length, and with corner flaps being respectively hingedly connected to the side edges of said trapezoidal end wall;

a triangular top panel having a base edge and two side edges, with the length of the base edge of said top panel being greater than the length of the base edge of said bottom panel, and with the length of said top panel measured along an imaginary line extending perpendicularly from the associated base edge to the opposed apex thereof being greater than the length of said bottom panel measured along an imaginary line extending perpendicularly from the associated base edge to the opposed apex thereof, said base edge of said top panel being hingedly connected and of equal length to the top edge of said trapezoidal end wall;

a pair of side wall panels extending from and hingedly connected to the associated side edges of said triangular top and bottom panels, with each side wall panel of one pair of said side wall panels including a pair of spaced, intermittent cut lines extending along the length thereof and defining a tear strip to permit easy opening of the erected carton which is of wedge-shaped configuration having a slanted trapezoidal end wall and which is useful for containing a wedge-shaped piece of pie having a slanted crust portion, with the carton conforming to the shape of said pie piece and with said sloping trapezoidal end wall functioning to provide increased protection and support to the slanted crust portion thereof.

4,313,543

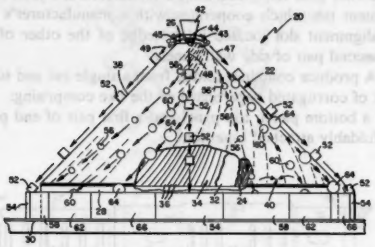
## MULTI-SIZE MATERIALS SEPARATOR

Malcolm M. Paterson, Lee, N.H., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 71,817, Sep. 4, 1979, abandoned. This application Jan. 26, 1981, Ser. No. 228,481

Int. Cl.³ B03C *1/08, 1/12*

U.S. Cl. 209—212 28 Claims



1. Materials separator apparatus comprising:

material conductor means disposed for directing commingled particles including electrically conductive nonferromagnetic particles of various materials and sizes into a stream;

magnetic means including an alternating series of oppositely polarized magnetic pole pieces disposed in juxtaposed and substantially contiguous relationship for establishing a spatially alternating array of juxtaposed oppositely directed magnetic fields of varying widths and inducing in said electrically conductive nonferromagnetic particles successive eddy-currents which cooperate with said magnetic fields for deflecting said electrically conductive particles in a uniform direction out of said stream; and

control means for producing relative movement of the particles sequentially through the magnetic fields.

4,313,544

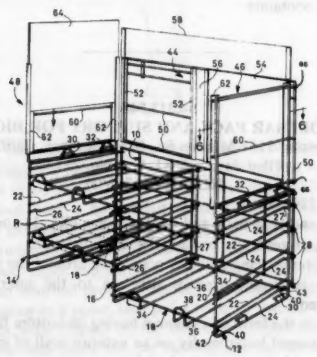
## DISPLAY RACK

Richard D. A. Ashton, R.R. 1, Terra Cotta, Ontario, Canada

Division of Ser. No. 962,168, Nov. 20, 1978, Pat. No. 4,226,190. This application Jun. 9, 1980, Ser. No. 157,445

Int. Cl.³ A47F *5/01, 5/16*

U.S. Cl. 211—181 6 Claims



1. Display rack, for use in association with merchandise storage means, having shelving for the storage of merchandise thereon, said display rack being adapted to be located above said shelving for supporting display panels showing merchandise information thereon, said display rack comprising;

back support frame means, having side edges and top and bottom edges;

side support frame means connected with said back support frame means along both side edges thereof, said side support frame means having side edges and top and bottom edges;

means for connecting said side frame means to said back support frame means, to form a generally three-sided rectangular structure;

interlocking attachment means on some of said frame support members, for interengagement with said shelving, whereby the same may be erected thereabove, and,

elongated channel members fastened in parallel spaced apart location on opposite side edges of said side frame support means and of said back frame support means, defining opposed open grooves, for reception of opposite side edges of said display panel means therein.

4,313,545

## METALLIC PRESSURE VESSEL WITH THIN WALL

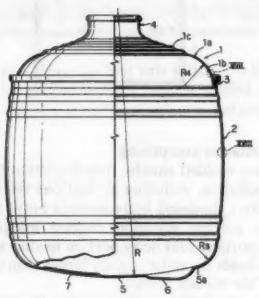
Kenichi Maeda, Neyagawa, Japan, assignor to The Nippon Aluminum Mfg. Co., Ltd., Osaka, Japan

Filed Feb. 4, 1980, Ser. No. 118,108

Claims priority, application Japan, Feb. 13, 1979, 54-15892; Oct. 8, 1979, 54-130205; Oct. 9, 1979, 54-130535; Oct. 9, 1979, 54-139959[U]; Nov. 5, 1979, 54-143641

Int. Cl.³ B65D *8/08, 8/12, 8/18*

U.S. Cl. 220—1 BC 11 Claims



1. A metallic pressure vessel capable of withstanding 3–4 kg/cm² internal pressure, comprising:

a main body piece of bottomed cylindrical form comprising a single piece of sheet aluminum or aluminum alloy having a thickness between 0.3 mm and 1.0 mm and having a resin coating layer, which is thin relative to the thickness of the sheet, on the surface thereof, the side portion thereof being bulged outwardly in an archshape in its cross section; and

a lid piece made of a single piece of sheet aluminum or aluminum alloy having a thickness between 0.3 mm and 1.0 mm and having a relatively thin resin coating layer on the surface thereof, and being secured to the upper opening of said main body piece by means of a gas-tight attachment, thereby covering same, said lid piece being in the shape of an inverted bowl-like portion, the diameter of which gradually decreases upwards from the portion thereof attached to said main body piece, having a plurality of annular concentrically formed convex-and-concave patterns, which continuously describe a gentle and smooth wave in the cross-sectional view thereof, and a mouth portion integrally formed with said inverted bowl-like portion as a protrusion extending outwardly from the central part thereof,

wherein the bottom of said bowl-like portion of said lid piece, at the point of said gas-tight attachment to said main

body, has a recess the bottom of which is substantially U-shaped in axial cross-section of the vessel and which bottom is disposed a substantial distance below said attachment, wherein the exterior arm of said recess extends up from said bottom and then into said attachment, and wherein the interior arm of said recess extends from said bottom in a curve which is convex as viewed from outside the vessel and is arcuately bowed in axial cross-section, said curve continuing to a height a substantial distance above said attachment at the uppermost portion of said main body piece, thereby forming a substantially round shoulder portion, said plurality of annular convex-and-concave patterns beginning at the uppermost portion of said shoulder and extending to a point near said mouth portion.

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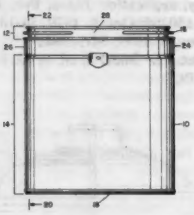
**4,313,546**
**CONTAINER**
**William G. Holt, Lakeville, Mass., assignor to Hercules Incorporated, Wilmington, Del.**
**Filed Dec. 18, 1980, Ser. No. 217,714**
**Int. Cl.³ B65D** *6/34, 8/04, 8/06*
**U.S. Cl. 220—74** **6 Claims**



1. In a container comprising:
an injection molded annular mouth portion having detail of high definition, including at least one reinforcing rib,
a generally cylindrical body portion blow molded from a parison portion injection molded integrally with the mouth portion, said body portion having a closed bottom and an inside diameter slightly larger than the inside diameter of the mouth portion,
an annular reinforcing region joining the mouth portion to the body portion and forming a transitional surface therebetween,
an annular depending skirt provided as a feature of the detail of high definition in the injection molded annular mouth portion, which depending skirt provides an outside wall over said reinforcing region,
in which the improvement comprises:
at least one gap in the uppermost reinforcing rib whereby manual removal of an attached lid can be accommodated without the need for a tool.

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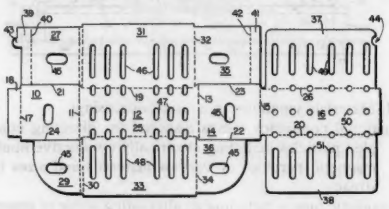
**4,313,547**
**PRODUCE CONTAINER**
**Edward L. Osborne, Kansas City, Kans., assignor to Westvaco Corporation, New York, N.Y.**
**Filed Jun. 23, 1980, Ser. No. 162,250**
**Int. Cl.³ B65D** *5/36, 5/56*
**U.S. Cl. 220—416** **6 Claims**

1. A blank of corrugated paperboard or the like of substantially rectangular configuration that is cut and scored for folding into a produce container with an integral top comprising:
(a) a central portion divided by four parallel spaced apart transverse score lines into a manufacturer's joint, a top panel, a first pair of end panels and a bottom panel;
(b) an upper portion comprising a first pair of side wall panels foldably attached to the top and bottom panels of said central portion, one of said first side wall panels further including a second pair of end wall/tuck panels foldably attached thereto; and,
(c) a lower portion comprising a second pair of side wall panels foldably attached to the top and bottom panels of said central portion, one of said second side wall panels further including a third pair of end wall panels foldably attached thereto, said third pair of end wall panels each including an integral corner post flap, and one of said corner post flaps including a manufacturer's joint alignment tab which cooperates with a manufacturer's joint alignment slot located in the edge of the other of said second pair of side wall panels.

2. A produce container folded from a single cut and scored blank of corrugated paperboard or the like comprising:
(a) a bottom panel, top panel and a first pair of end panels foldably attached together;



(b) a manufacturer's joint foldably attached to one of said first pair of end panels and attached to the free end of said bottom panel;
(c) a first pair of side wall panels foldably attached along one edge of said top and bottom panels;
(d) a second pair of side wall panels foldably attached along the opposite edge of said top and bottom panels;
(e) a second pair of end wall/tuck panels foldably attached to the opposite edges of one of said second pair of side wall panels;
(f) a third pair of end wall panels foldably attached to the opposite edges of one of said second pair of side wall panels to provide a final construction having three-ply end walls, two-ply side walls and an integral top and bottom, said third pair of end wall panels further including integral corner post flaps, one of said corner post flaps having an alignment means for aligning said blank before erecting said container.

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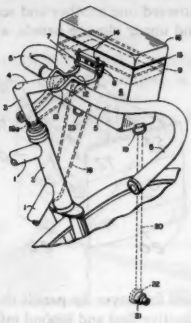
**4,313,548**
**HANDLEBAR PACK AND SUPPORT FOR BICYCLE**
**Jack Edelson, 1161 Mission St., San Francisco, Calif. 94103**
**Filed Jan. 5, 1981, Ser. No. 222,659**
**Int. Cl.³ B62J** *7/06*
**U.S. Cl. 224—36** **8 Claims**

1. A handlebar pack and support for a bicycle comprising:
a pack of generally rectangular configuration;
a rigid reinforcing member positioned around the interior of said pack and fixedly attached to the interior walls thereof;
a cleat in the form of a channel having its bottom flat section positioned horizontally on an exterior wall of said pack;
said cleat being characterized by:
means for fastening said cleat to said reinforcing member through said wall of said pack;
a pair of holes through the horizontally projecting legs of said channel oppositely spaced adjacent the ends thereof;

a curved hook having a clamping central section engaging a gooseneck supporting the handlebars of said bicycle;
said hook having a pair of vertical prongs at the end thereof;



said prongs engaging the holes in said channel legs;
resilient fastening means detachably engaging said pack and the frame of said bicycle.

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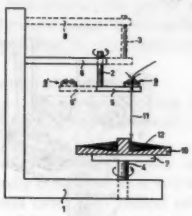
**4,313,549**
**STRINGING DEVICE FOR RETAINING FISH**
**Dennis I. Nelson, 3811 S. County Rd., 13C, Loveland, Colo. 80537**
**Filed May 23, 1977, Ser. No. 799,671**
**Int. Cl.³ A45F *5/00***
**U.S. Cl. 224—103** **9 Claims**

2. A fish stringing implement for use in holding, retaining and stringing a fish onto a flexible retaining line comprising a straight shank secured at one end to said line and formed at its other end with a downward bend, a downwardly and forwardly inclined shank leg extending from said downward bend and terminating in a bight, a prong leg extending upwardly from said bight and formed at its upper end with a reverse bend, an inturned prong extending from said reverse bend and terminating in a point, said point lying in spaced vertical relationship with respect to the downward bend on said shank whereby said point can be hooked into a fish and the fish retained in said bight for subsequent stringing onto said retaining line, and means connecting said one end of said straight shank portion to said line for enabling said user to further string said fish onto the flexible line by holding said prong leg portion and sliding said fish over said shank portion onto said line.

**4,313,550**
**PACKAGE CONTAINING OPTICAL FIBRES MADE OF GLASS AND APPARATUS FOR PACKING GLASS OPTICAL FIBRES**
**Cornelis J. Van Gorp, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**
**Filed Mar. 6, 1980, Ser. No. 127,693**
**Claims priority, application Netherlands, Sep. 17, 1979, 7906904**
**Int. Cl.³ B65H *17/20***
**U.S. Cl. 226—194** **11 Claims**



1. An apparatus for packaging optical fibers comprising;
a frame;
a plate support mounted on the frame;
a plate mounted on the plate support;
a feeder for feeding optical fiber onto the plate, said feeder being mounted on the frame for revolving around a first axis, said first axis being oriented transverse to the plate; and
means for revolving the first axis relative to the plate, said relative revolution being around a second axis which is oriented transverse to the plate but is not coaxial with the first axis.

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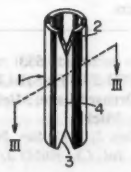
**4,313,551**
**TAPE GUIDE APPARATUS**
**Yozaburu Umehara, 2-8-6, Shakujiimachi, Nerima-ku, Japan**
**Division of Ser. No. 940,198, Sep. 7, 1978, Pat. No. 4,228,940. This application Sep. 25, 1980, Ser. No. 190,755**
**Claims priority, application Japan, Sep. 14, 1977, 52-124344; Mar. 3, 1978, 53-24344**
**Int. Cl.³ B65H *23/04, 27/00***
**U.S. Cl. 226—196** **1 Claim**



1. A tape guide comprising a base body formed into a tube, said base body having at the both ends a pair of cutout portions of substantially isosceles triangular-shape which are symmetrically arranged along the axial direction of said base body, and said base body further having a slit extending between the opposite vertexes of said cutout portion and at which the opposite abutment edges of a sheet rolled to form said base body engage closely.

**4,313,552**

## APPARATUS FOR DRIVING FASTENERS

**Werner Maurer, Zizishausen, Fed. Rep. of Germany, assignor to Firma Karl M. Reich Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany**

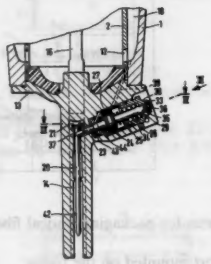
**Continuation-in-part of Ser. No. 68,746, Aug. 23, 1979. This application Apr. 29, 1980, Ser. No. 144,950**

**Claims priority, application Fed. Rep. of Germany, Sep. 1, 1978, 2838194; May 19, 1979, 2920342**

**The portion of the term of this patent subsequent to Jun. 2, 1998, has been disclaimed.**

**Int. Cl.³ B25C *1/04***

**U.S. Cl. 227—109** **6 Claims**



1. A driving apparatus for driving fasteners having shafts into a work piece, said apparatus being able to receive fasteners loosely slidable relative to each other in a row in the guide channel of a magazine, comprising housing means, fastener driving means in said housing means, said fastener driving means comprising driving rod means and ejector channel means, said driving rod means being movable in said ejector channel means between a rest position and a driving position, said apparatus further comprising magazine and guide channel means operatively connectable to said housing means for supplying fasteners loosely slidable in a row from said magazine and guide channel means into said ejector channel means, separator means operatively arranged relative to said magazine means and said ejector channel means, said separator means including a separator member having a tip movable for extending into and retracting the row of fasteners between a fastener stop position for holding back the row of fasteners from the ejector channel means and a fastener releasing position for releasing a fastener into the ejector channel means, said apparatus further comprising holding means so positioned relative said ejector channel means and relative to said separator means as to hold a fastener released by said separator member in said ejector channel means, and position adjusting means operatively connected to said separator member for manually adjusting the spacing of said separator member tip relative to said ejector channel means thereby to accommodate different spacings between fasteners.

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**4,313,553**

## CONTAINER WITH EXTENSIBLE POURING SPOUT

**Robert E. Lisiecki, Orchard Lake, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.**

**Filed Oct. 2, 1980, Ser. No. 193,328**

**Int. Cl.³ B65D *5/74***

**U.S. Cl. 229—17 G** **7 Claims**

1. A top closure arrangement for a container having a four-sided body portion, said top closure arrangement comprising:

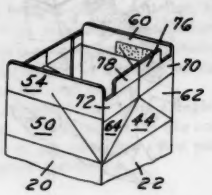
(a) first and second triangular gable panels extending from two oppositely disposed sides of said body portion,

(b) first and second lower closure panels extending from the other two oppositely disposed sides of said body portion,

(c) first and second sets of fold-back panels interconnecting said respective first and second triangular gable panels and lower closure panels, and being folded against the latter,

(d) first and second upper closure panels extending vertically from said respective first and second lower closure panels,

(e) first and second infold lips extending from each of said respective first and second sets of fold-back panels and being folded toward one another and sealed between said first and second upper closure panels, and




(f) first and second fold-over lip panels extending from one set of said respective first and second infold lips and being folded over onto the latter, and folded and sealed against one another between said one set of first and second folded infold lips.

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**4,313,554**

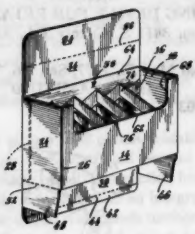
## MULTI-CELL DIVIDER CARTON

**James Montealegre, St. Paul, Minn., assignor to Champion International Corporation, Stamford, Conn.**

**Filed Jun. 2, 1980, Ser. No. 155,096**

**Int. Cl.³ B65D *5/48***

**U.S. Cl. 229—28 R** **18 Claims**



1. A multi-cell divider carton comprising

a front wall,

a substantially parallel rear wall,

a pair of side walls connecting said front and rear walls,

a bottom wall,

a top wall cover element hingedly connected to said rear wall, and

a divider panel within the interior of said carton between said front, rear, and side wall, said divider panel including

a portion secured to said rear wall and a second portion secured to said front wall,

a divider wall substantially parallel to and spaced from said front and rear walls extending substantially the entire width of said carton between said side walls, said divider wall being hingedly connected to said first divider wall portion secured to said rear wall by

a first set of a plurality of parallelogram strips hingedly connected to said portion secured to said rear wall and said divider wall, and

a second set of a plurality of parallelogram strips extending between a portion of said divider panel secured to said front wall and a portion of said divider panel secured to said rear wall of above said first set of parallelogram strips extending between the portion of said divider panel secured to said rear wall and said divider wall,

said first and second sets of parallelogram strips having individual strips lying in corresponding vertical planes to form with said divider wall a plurality of compartments within said carton.

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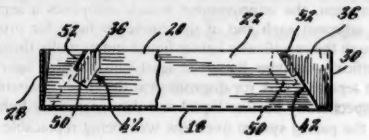
4,313,555

## CORNER LOCK CARTON

William G. Sieffert, Joliet, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Jun. 16, 1980, Ser. No. 159,454
Int. Cl.³ B65D 5/26
U.S. Cl. 229—35 6 Claims



1. A carton construction comprising:
a tray having a plurality of upright tray sidewalls;
at least a first of said tray sidewalls having a laterally extending flap provided with a first hook-like member projecting therefrom;
a second of said tray sidewalls, adjacent to said first tray sidewall, having a slot for interleaving engagement with said first hook-like member to lock said first and second tray sidewalls together in an erected state; and
a cover having a plurality of upright cover sidewalls;
at least a first of said cover sidewalls having a laterally extending flap provided with a second hook-like member projecting therefrom;
a second of said cover sidewalls, adjacent to said first cover sidewall, having a slot for interleaving engagement with said second hook-like member to lock said first and second cover sidewalls together in an erected state;
said cover being adapted to be received on said tray so that the interlocked corner of said tray is adjacent an unconnected corner of said cover and the interlocked corner of said cover is adjacent an unconnected corner of said tray.

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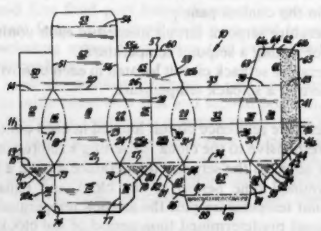
4,313,556

## CARTON HAVING FOLDABLE BOTTOM AND CARTON BLANK

Daniel J. Boyle, Hartland, and Harold R. Jaeschke, Milwaukee, both of Wis., assignors to Champion International Corporation, Stamford, Conn.

Filed Oct. 14, 1980, Ser. No. 196,789
Int. Cl.³ B65D 5/08
U.S. Cl. 229—38 4 Claims



1. A one-piece paperboard carton blank adapted to be glued and then erected into a carton; said blank comprising:
four central side panels which form the sides of the carton, said side panels being arranged in tandem along an imaginary central axis and being connected by fold lines;
a plurality of top flap members connected by fold lines to certain of the central side panels, said top flap members being adapted to form the top of the erected carton;
a first rectangular bottom panel and a second rectangular bottom panel, each of said bottom panels being connected by fold lines to the two side panels which form opposite sides of the erected carton; and
a connection panel connected by a fold line to the second bottom panel and having a glue means to adhere it to the first bottom panel;
wherein the other two central side panels which are not connected to said bottom panels have fold lines perpendicular to said axis to enable the glued and unerected carton to lie flat;
the carton blank further comprising:
four bottom support panels, each bottom support panel being connected by a fold line to a side of a bottom panel; and
four equilateral triangular shaped panels, each triangular panel being hingedly connected by a fold line to the bottom of one of said other two central side panels and, hingedly connected by a fold line to one of said bottom support panels, and having glue means to adhere said each triangular panel to the side panel to which it is connected, said carton blank further comprising corner panels connected by fold lines to said central side panels, said corner panels being aligned between said side panels and aligned along said imaginary axis.

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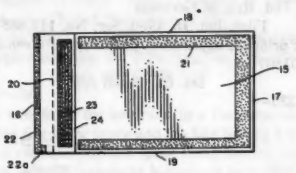
4,313,557

## ENVELOPE INSERT FOR MAGAZINES

John F. Foffel, St. Charles, Ill., assignor to Berlin Industries, Inc., Addison, Ill.

Filed May 14, 1980, Ser. No. 149,851
Int. Cl.³ B65D 27/00, 27/14
U.S. Cl. 229—68 R 7 Claims



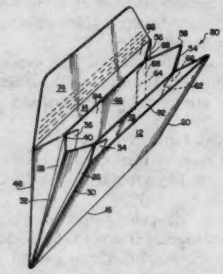
1. An envelope insert for a magazine or the like comprising a pair of superposed sheets, each of said sheets having a pair of end edges, each end edge of each sheet overlying an end edge of the other sheet whereby said envelope has a constant thickness provided by said pair of sheets between said end edges, one of said sheets having a perforation line spaced from one of the end edges of the sheet and the other of said sheets having a perforation line between said perforation line of said one sheet and the end edge of said other sheet which overlies said one end of said one sheet to provide a flap portion on said other sheet between the perforation line of said other sheet and the perforation line of said one sheet, and adhesive on the flap portion, whereby when the sheets are torn along said perforation lines the flap portion of said other sheet can be folded over said one sheet and secured thereto.

4,313,558

## MULTIPLE POCKET, EXPANDABLE ENVELOPE, AND BLANK AND METHOD FOR FORMING SAME

Albert A. Benham, Granville, Mass., assignor to Champion International Corporation, Stamford, Conn.

Filed Feb. 28, 1980, Ser. No. 125,364
Int. Cl.[3] B65D 27/08
U.S. Cl. 229—72 12 Claims



1. A multiple pocket, expandable envelope formed from a planar, unitary blank, comprising:

front and back panels having opposed end edges and opposed first and second side edges and being hingedly coupled at adjacent end edges thereof along a fold line;

front and back divider panels each having opposed first and second side edges and opposed first and second surfaces, said front divider panel hingedly coupled along a fold line at its first side edge to said front panel and said back divider panel hingedly coupled along a fold line at its second side edge to said back panel;

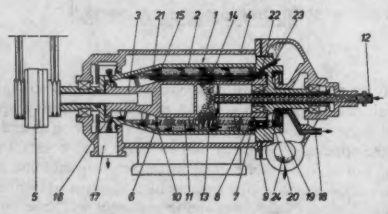
first means hingedly coupling said front panel at said second side edge thereof to said front divider panel; second means hingedly coupling said front and back divider panels; and third means hingedly coupling said back panel at said second side edge thereof to said back divider panel.

4,313,559

## FULLY JACKETED HELICAL CENTRIFUGE

Willi Ostkamp, Oelde, and Theodor Paschedag, Beckum, both of Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Jan. 16, 1980, Ser. No. 112,685
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1979, 2901607
Int. Cl.[3] B04B 3/04
U.S. Cl. 233—7 5 Claims



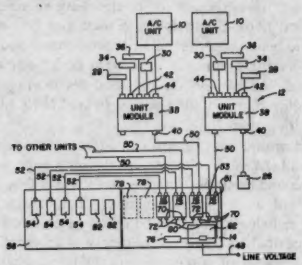
1. Helical centrifuge suitable for the separation of a mixture of a specifically heavier liquid, a specifically lighter liquid and solid particles, having an at least partially conical drum which can be driven rotationally, and a conveyor helix which can be driven rotationally at a different speed disposed coaxially within the drum, the drum and the helix defining a separating chamber for the separation, the spirals of the helix being constructed to conform to the inner wall of the drum with a corresponding conical section for driving the solid particles settling under centrifugal force in the separating chamber to one end of the drum, means defining a solids discharge opening at said one end of the drum for receiving the separated solid particles from the conveyor helix, a paring system disposed at the other end of the drum for removal of one of said liquids comprising a receiving chamber and a first overflow weir and means communicating the separating chamber with the paring system for removal of said one of said liquids by the paring system, a catchment for the other of said liquids disposed at said other end of the drum, a second overflow weir for receiving the second liquid from the separating chamber and means communicating the second overflow weir with the catchment, means sealing the catchment from the receiving chamber of the paring system, the improvement which comprises a separating disk adjacent each end of the conveyor helix for projecting through the specifically lighter liquid and partially through the specifically heavier liquid, at least one closable aperture in each separator disk for disposition at the zone of separation of the specifically heavier liquid and the specifically lighter liquid, the paring system overflow weir being replacable.

4,313,560

## CONTROL SYSTEM FOR ENVIRONMENTAL UNITS

Jack L. Stiles, 3912 Acapulco, Irving, Tex. 75062

Filed Jul. 29, 1980, Ser. No. 173,671
Int. Cl.[3] F23N 5/20; F25B 29/00
U.S. Cl. 236—46 R 11 Claims




1. A system for controlling a plurality of zoned environmental units such as air heaters or air conditioners, each unit having means for adjusting the ratio of intake air between return air from the environmental zone and fresh air from outside the environmental zone brought into the unit and a blower motor for forcing the intake air through the unit and into the environmental zone, the system comprising:

means for sensing the temperature within each environmental zone;

a control panel;

a control module associated with each unit, located on or within the control panel;

a temperature setpoint circuit located in each control module for setting a setpoint temperature;

a temperature setback circuit located in each control module for setting a setback temperature;

a clock;

a temperature reference circuit located in each control module, responsive to the clock for setting a reference temperature equal to the setpoint temperature during a first predetermined time period of the clock and equal to the setpoint temperature plus the setback temperature during a second predetermined time period of the clock;

means associated with each unit for turning the unit and the blower motor on when the difference between the temperature sensed by the temperature sensing means and the reference temperature for that unit is a predetermined turn

on amount and off when the difference is a predetermined turn off amount; and

connectors affixed to each control module and electrically connected to the temperature setpoint circuit, the temperature setback circuit and the temperature reference circuit located within that control module wherein those circuits can be installed as a single unit by installing the control module and electrical connections can be made to those circuits from the outside of that control module by use of the connectors.

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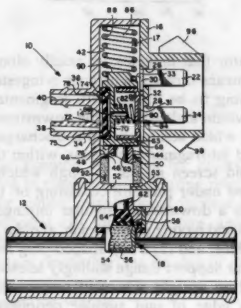
**4,313,561**

## TEMPERATURE CONTROL SYSTEM AND THERMALLY RESPONSIVE ELECTRO-VACUUM RELAY THEREFOR

**Andrew A. Kenny, Roselle, Ill., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Apr. 28, 1980, Ser. No. 144,794**
**Int. Cl.³ B60H *1/12***
**U.S. Cl. 237—12.3 A** **27 Claims**



**24**. A system for controlling ambient air flow in a passenger vehicle intake air duct, said vehicle having a fluid cooling system, an air intake duct, a shut-off door positionable in the flow of air through said duct, said door movable between an open and closed position, a low pressure source, and an electrical power source, said system comprising:

(a) blower means for forcing ambient air through said duct, said blower means including an electric motor for driving same;

(b) relay means, said relay means including,

(i) housing means, said housing means having structure defining a vent chamber and an internal wall portion in fluid communication with said vent chamber, said internal wall portion defining a valve seat, said housing means having a first fluid port in fluid communication with said vent chamber and opening into said wall portion, a second fluid port in fluid communication with said vent chamber and opening into said wall portion, said first fluid port being disposed in spaced arrangement from said second fluid port, said housing means including means for venting said vent chamber to the atmosphere,

(ii) a carrier member received in said vent chamber and movable between a first and second position,

(iii) thermally responsive actuator means associated with said housing means and operative to move said carrier member from said first to said second position, said actuator means having a temperature sensitive portion in heat transfer relationship with said fluid cooling system,

(iv) valve means operably connected to said carrier member and movable therewith, said valve means including a member having resilient valve surface portions defining in co-operation with said internal wall portion a movable valve chamber therebetween, wherein said first and second fluid ports are spaced such that upon movement of said carrier to said first position said first and second ports are in mutual communication and isolated from said vent chamber and in said second position said first port communicates with said vent chamber and said second port is isolated from said first port and said vent chamber,

(v) electrical switch means, said switch means including contact means mounted on said carrier member and movable therewith, a pair of spaced, stationary terminals mounted on said housing means and having contact surface portions extending within said vent chamber, said contact member having an actuated condition completing a circuit between said first and second terminals and an unactuated condition breaking a circuit between said terminals,

(vi) means for commonly biasing said valve means toward said valve seat and said contact means toward said contact surface portions;

(c) means for communicating said second port with said low pressure source;

(d) vacuum motor means, said motor means including an output member operably connected to said damper door for moving said door between said open and closed positions;

(e) means for communicating said first port with said vacuum motor means, such that upon communication of said vacuum source thereto said vacuum motor means output member moves said shut-off door to said closed position and upon atmospheric venting of said first port said vacuum motor means moves said door to said open position; and

(f) circuit means for connecting said electrical power source to said blower means, said switch means connected along said circuit means intermediate said electrical power source and said blower means, such that as said carrier member is in said first position, said switch means is in said open position and said blower means is de-energized and as said carrier member is in said second position said switch means is in said closed position and said blower means is energized.

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**4,313,562**

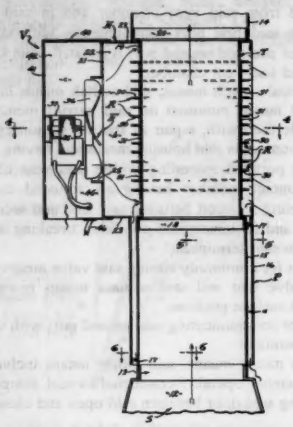
## FLUE HEAT VENTILATOR

**Ralph H. White, Burbank, Calif., assignor to Modern-Aire Ventilating, Inc., North Hollywood, Calif.**

**Continuation of Ser. No. 14,704, Feb. 23, 1979, abandoned. This application Sep. 29, 1980, Ser. No. 191,365**
**Int. Cl.³ F24B *7/00***
**U.S. Cl. 237—55** **3 Claims**

**1**. A heat ventilator for insertion in a flue pipe and spaced above an open fire place stove and the like having a hood from which heat is radiated into the space being heated, and including; a double walled connector having an inner tube in open communication with said stove and having a closely surrounding outer tube forming an annulus inlet above the stove for upward convection of closely surrounding air from the heated hood and completely surrounding the stove, a longitudinally disposed flue in open communication with the inner tube of the connector and with said flue pipe, a transverse housing above the hood and in open communication with the connector annulus to receive said convection flow of air from the hood completely surrounding the stove and into a passage transversely over the flue tube and having a downwardly open plenum for receiving upward convection flow of heated air from the space being heated at one side of the stove, the housing having a front opening for the discharge of heated air into the space being heated surrounding the stove, transversely disposed spaced and parallel radiator plates engaged over the flue tube and occupying the housing passage to absorb heat from the flue and dissipate the same into the body of air in the

housing passage, and a motor driven fan disposed in the plenum of the housing for delivering pre-heated air received from



the hood completely surrounding the stove and moving said air over the plates and from the front opening of the housing.

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4,313,563

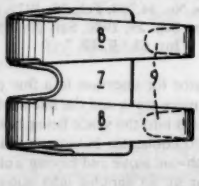
**RAIL FASTENER**

**Hartley F. Young, Melton, Australia, assignor to Ralph McKay Limited, Victoria, Australia**

**Continuation of Ser. No. 919,618, Jun. 27, 1978, abandoned. This application Mar. 10, 1980, Ser. No. 128,405**

**Int. Cl.³ E01B *9/62***

**U.S. Cl. 238—349** **3 Claims**



1. In rail fastening apparatus including a clip adapted for fastening an associated rail to an associated sleeper, said clip comprising a U-shaped member formed from metal plate having a base and two substantially uniformly tapered arms extending therefrom, each of said arms being substantially uniformly tapered over substantially its entire length to a tip portion said base adapted to be secured to said sleeper outwardly spaced from the foot of said rail, said arms being bent inwardly beyond said base in a large arc with the tip portion of said arms being bent back toward and short of said base and oriented for contact with the foot of said rail such that said arms are deflected upwardly relative to said rail to develop downward clamping forces at said tip portions tending to hold said rail on said sleeper against vertical, lateral and longitudinal movement.

4,313,564

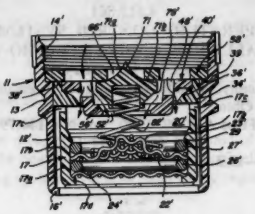
**SELF-CLEANING AERATOR WITH NOISE REDUCTION**

**Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502**

**Continuation-in-part of Ser. No. 4,061, Jan. 17, 1979, Pat. No. 4,214,702, which is a continuation-in-part of Ser. No. 938,901, Sep. 1, 1978, Pat. No. 4,221,335. This application Jul. 7, 1980, Ser. No. 166,341**

**Int. Cl.³ E03C *1/08***

**U.S. Cl. 239—110** **4 Claims**



1. In an aerator that includes: an axially elongated tubular casing having means through which air is ingested to the interior of the casing to be mixed with fragmented liquid jets; screen means within and adjacent the downstream end of said casing through which aerated liquid is discharged; and plastic jet-defining and jet-fragmenting means, within the casing and upstream of said screen means, through which liquid to be aerated is forced under pressure consisting of: (1) an annular guide ring with a downstream annular impingement surface defined thereon and having an upstream, annular, support edge disposed in a plane; and (2) a cup-shaped plug member having an upper annular support flange slidingly telescoped into said guide ring and an upright side wall projecting downstream from the inner edge of said annular peripheral flange, the upstream side of said support flange lying in the same plane with the annular support edge of the guide ring, the upright side wall being provided therein with a series of axially elongated slots that extend downstream from the upstream side of said support flange and operates to provide the liquid required to effect aeration of the liquid;

the improvement of self-cleaning and noise reducing character for said aerator comprising, in combination:

(a) said plug member being formed as an annulus with a relatively large central flow opening through the downstream transverse wall of said cup-shaped member;

(b) a shape-retaining washer supported at least on the annular support edge of the guide ring; said washer having radially spaced outer and inner concentric annular lands interconnected by a plurality of radial lands, the inner annular land bounding and defining a central flow passageway, and the annulus between said outer and inner annular lands providing therethrough a plurality of circumferentially spaced primary flow passageways through which flow of liquid is initially directed downstream to scrub and dislodge, from the plug member's axially elongated slots, debris that may have lodged therein, and to flush same through the central flow opening of said plug member;

(c) a flow-blocking valve member located downstream of the washer and being resiliently biased upstream toward engagement with the washer, said valve member being movable downstream under force of flowing liquid to close the central flow opening of the plug member after dislodged debris has passed therethrough, and to restore normal aerating operation of the aerator; and

(d) the upstream end of said valve member having a diameter greater than the diameter of the central flow opening of the washer and being shaped to provide thereon both a seal portion for engaging and sealing against the downstream periphery of the central flow passageway

through the washer, and a cavitation noise reducing means.

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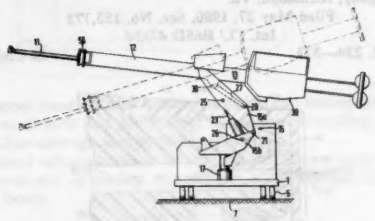
**4,313,565**

## APPARATUS FOR THE PROJECTION OF REFRACTORY AND OTHER MATERIAL PARTICULARLY FOR THE REPAIR OF THE LININGS OF METALLURGICAL PLANT

**Jean Focant, Lessive, Belgium, assignor to Stephan Pasek & Cie, Societe Anonyme, Anhee and Cockerill, Societe Anonyme, Seraing, both of, Belgium, a part interest**

**Filed Apr. 4, 1979, Ser. No. 26,590**
**Claims priority, application Luxembourg, Apr. 7, 1978, 79401**
**Int. Cl.³ B05B *13/06***
**U.S. Cl. 239—132.3** **3 Claims**



1. A mobile gunning apparatus for projecting refractory material in hard to reach locations during relining or repairing a converter or similar metallurgical furnace tiltable about a generally horizontal axis for discharging, and relining or repairing the discharge opening thereof, without excessively tilting the furnace or discharging its slag or damaging its discharge opening, comprising

a base mounted on wheels,

a scissors-like, upright, support member having an upper arm pivotably connected to a lower arm for relative movement about a generally horizontal first pivot,

a first adjusting means operatively connecting said arms for causing relative movement of said arms about the first pivot for opening and closing the arms in scissors-like fashion,

one of said arms being pivotably connected to the base for relative movement about a generally vertical second pivot spaced from said first pivot connection between said arms,

a lance carrier operatively connected to the other of said arms for relative movement about a generally horizontal third pivot,

a second adjusting means operatively connecting said lance carrier and other arm for causing relative movement of said other arm and lance carrier about said third pivot,

a lance comprising a primary lance and a secondary lance having relative movement in a path generally perpendicular to said first pivot,

said primary lance being slidably mounted on said lance carrier for relative movement thereto,

said secondary lance having a nozzle on its distal end and being telescopically mounted in the primary lance for relative movement thereto and for relative movement through said discharge opening, in said furnace and generally perpendicular to the axis of each of said pivots,

means for moving said secondary lance by endwise and rotatable relative movement relative to said primary lance,

means on said base for preparing refractory material and operatively connected by a conduit to said nozzle for projecting said refractory material from the nozzle on the secondary lance,

so that during gunning only the nozzle and a portion of the lance are in the discharge opening or inside the furnace while the remainder of the apparatus is located outside the furnace, and

with the relative movements permitting relative pivoting about the generally vertical and horizontal axes, raising and lowering of the lance carrier and its lance relative to said base, and moving the secondary lance endwise and rotatably relative to the lance carrier and primary lance for directing refractory material from its nozzle with precision at any convenient angle or location within the furnace or its discharge opening without excessively tilting the furnace or discharging its slag or damaging its discharge opening.

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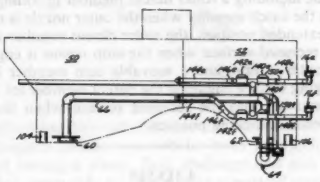
**4,313,566**

## FLUID BALANCING SYSTEM FOR TANK VEHICLE

**Richard F. Klein, 20911 Via Verde, Covina, Calif. 91722**

**Continuation of Ser. No. 44,850, Jun. 4, 1979, abandoned. This application Jul. 17, 1980, Ser. No. 169,761**
**Int. Cl.³ A01G *25/09*; E01C *19/16*; E01H *3/02***
**U.S. Cl. 239—172** **9 Claims**



1. A fluid spray tanker suitable for balanced operation while traveling on a grade, the tanker having a vehicle body comprising:

(a) a tank body supported on said vehicle body and having a forwardly positioned section and a rearwardly positioned section, each section providing a containment for said fluid,

(b) fluid spray means for spraying said fluid onto said grade traveled by said tanker,

(c) fluid conduit means connecting said forwardly positioned section and said rearwardly positioned section to said fluid spray means,

(d) valve means connected to said fluid conduit means for selectively connecting said forwardly and rearwardly positioned sections to said spray means,

(e) means for connecting said rearwardly positioned section to said spray means when said vehicle is moving on an uphill grade, and

(f) means for detecting the level of fluid in said rearwardly positioned section and means for operating said valve means for connecting said forwardly positioned section to said spray means when said tanker is traveling on an uphill grade and upon detection of a low level of fluid in said rearwardly positioned section.

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**4,313,567**

## CAM-LOCK ROCKET SECURING MECHANISM

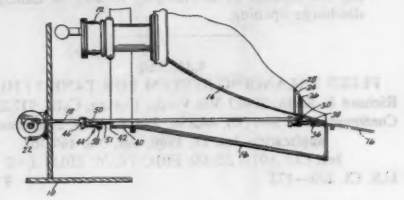
**Robert A. Feight, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Dec. 3, 1979, Ser. No. 99,675**
**Int. Cl.³ F02K *1/09***
**U.S. Cl. 239—265.33** **12 Claims**

1. An extendible rocket engine nozzle, comprising:

a main nozzle;

an outer nozzle section concentric with the main nozzle;
means secured to the main nozzle for moving the outer nozzle section in an axial direction relative to the main nozzle between a retracted position and an extended position;
stop means engaged by the outer nozzle for positioning said outer nozzle in fixed relation to said main nozzle when the outer nozzle is moved to the extended position;
latching means for locking the nozzles together when the outer nozzle is moved to the extended position, including



a catch member secured to the outside of the main nozzle having a recessed surface, means supported on the outer nozzle including a roller detent member in rolling contact with the catch member when the outer nozzle is moved to the extended position, the roller detent member engaging said recessed surface when the stop means is engaged by the outer nozzle, and a movable cam member having a wedging surface engaging the detent member for wedging the member into the recessed surface when the cam is moved to a locking position.

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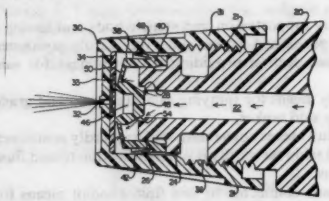
**4,313,568**

**FLUID DISPENSER METHOD AND APPARATUS**

**Joseph J. Shay, Manchester, N.H., assignor to Ethyl Products Company, Richmond, Va.**

**Filed May 27, 1980, Ser. No. 153,770**
**Int. Cl.³ B65D *47/34***
**U.S. Cl. 239—333** **19 Claims**



1. A nozzle for fitment to hand actuated liquid pumps having a barrel portion with a bore therethrough for passage of liquid, said nozzle comprising:
a. an integrally formed nozzle cap which includes
i. an end wall having a planar inside wall and an aperture through said planar wall through which liquid from said bore is dispensed, and
ii. a skirt portion having mounting means for mounting said nozzle cap around the end portion of said barrel;
b. an integrally formed sealing means attached to said barrel and enclosed by said nozzle cap, said sealing means having
i. a peripheral seal portion to provide a liquid-tight seal around said barrel between said nozzle cap and said barrel, and
ii. a check valve portion movably positioned at the mouth of said bore, said check valve portion including a seal member which selectively forms a liquid-tight bore seal with said mouth of said bore to close off the flow of liquid therethrough, and a spring member in operative relationship with said seal member whereby said spring member biases said seal member to form its said liquid-tight bore seal, but said spring member having a biasing strength sufficiently low to allow liquid pressure in said bore, developed by actuation of said pump, to move said seal member away from said bore so that said liquid-tight bore seal is opened and liquid in said bore can pass to said aperture in said nozzle cap; and
c. spray means fittable within said nozzle cap and in abutment with said planar wall, said spray means and said planar wall together providing a path for the liquid as it is dispensed, said path causing said liquid to break up and form a spray pattern.

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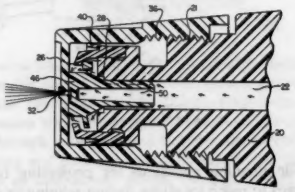
**4,313,569**

**FLUID DISPENSER METHOD AND APPARATUS**

**James E. Burke, Huntington, Conn., assignor to Ethyl Products Company, Richmond, Va.**

**Filed May 27, 1980, Ser. No. 153,772**
**Int. Cl.³ B65D *47/34***
**U.S. Cl. 239—333** **24 Claims**



1. A nozzle for fitment to hand actuated liquid pumps having a barrel portion with a bore therethrough for passage of liquid, said nozzle comprising:
a. an integrally formed nozzle cap which includes:
i. an end wall having an aperture through which liquid from said bore is dispensed, and
ii. a skirt portion having mounting means for mounting said nozzle cap around the end portion of said barrel;
b. an integrally formed nozzle seal means attached to said barrel and enclosed by said nozzle cap, said nozzle seal means providing a peripheral liquid-tight seal around said barrel between said nozzle cap and said barrel, and said nozzle seal means having stop means displaced outwardly from the end of said barrel; and
c. an integrally formed check valve means movably positioned at the mouth of said bore, said check valve means having,
i. a seal portion which selectively forms a liquid-tight bore seal with said end portion of said barrel to close off the flow of liquid through said bore, and
ii. a spring portion in operative relationship with said stop means whereby said spring portion biases said seal portion to form its said liquid-tight bore seal, but said spring portion having a biasing strength sufficiently low to allow liquid pressure in said bore, developed by actuation of said pump, to move said check valve away from said barrel end portion so that said liquid-tight bore seal is opened and liquid in said bore can pass to said aperture in nozzle cap.

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**4,313,570**

**HIGH PRESSURE CUTTING NOZZLE WITH ON-OFF CAPABILITY**

**John H. Olsen, Vashon, Wash., assignor to Flow Industries, Inc., Kent, Wash.**

**Filed Nov. 20, 1979, Ser. No. 96,219**
**Int. Cl.³ B05B *1/02*; E21B *7/18***
**U.S. Cl. 239—583** **17 Claims**

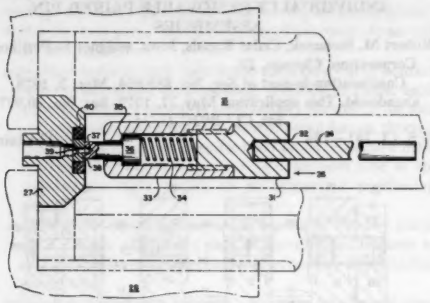
1. A high velocity liquid jet cutting nozzle comprising;

a housing having an inlet means for admitting high pressure working liquid thereto,

outlet means in said housing for said high pressure liquid,

jet forming means for forming a cutting jet of said liquid,

means mounting said jet forming means in said outlet means,



poppet means in said housing movable into sealing engagement with said jet forming means for controlling liquid flow through said jet forming means,

poppet actuation means for moving said poppet means into and out of sealing engagement with said jet forming means.

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**4,313,571**

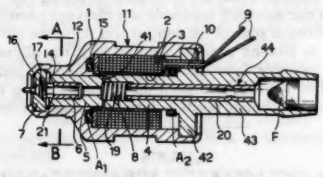
## ELECTROMAGNETICALLY ACTUATED INJECTOR FOR INTERNAL COMBUSTION ENGINE

**Francesco Bellicardi, and Franco Molinari, both of Bologna, Italy, assignors to Weber S.p.A., Bologna, Italy**

**Filed Dec. 21, 1979, Ser. No. 105,989**

**Int. Cl.³ B05B *1/32*; F16K *31/02***

**U.S. Cl. 239—585** **6 Claims**



1. An electromagnetically actuated injector for internal combustion engines comprising:

a hollow housing;

a magnetic core positioned within said housing and being operatively mounted adjacent an electric winding connected to a source of electric pulses;

a hollow extension coaxially projecting from one side of the housing;

an aperture at the free end of said extension;

a moving iron member slidably and axially mounted inside said hollow extension, coaxially with the winding and the core, and guided by the inner wall of the hollow extension, by means of contacting side surface zones;

said moving iron member and core having respective surfaces facing one another;

a needle valve secured to the moving iron member and extending through said aperture to open and close the aperture orifice;

added layers of wear-resistant diamagnetic material provided on (a) the side surface zones of the moving iron member which are slidably contacting the inner wall of said hollow extension, on (b) the surface of the moving iron member facing the core and on (c) the surface of the core facing the moving iron member, said layers having a respective predetermined controlled thickness to center the moving iron member and the needle valves secured thereto relative to the longitudinal axis of said hollow extension and to limit the axial distance between the aperture orifice and core, whereby the effects of residual magnetism on the moving iron member and needle valve are reduced.

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**4,313,572**

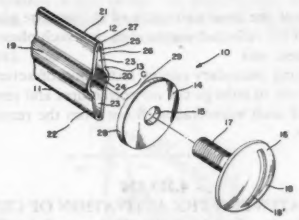
## ADJUSTABLE FLOW RATE FAN ATOMIZATION NOZZLE

**George C. Wood, Edenton, N.C., assignor to Patent Development of N.C., Raleigh, N.C.**

**Filed Apr. 17, 1980, Ser. No. 140,459**

**Int. Cl.³ B05B *1/14***

**U.S. Cl. 239—598** **13 Claims**



1. An adjustable flow rate fluid atomization nozzle comprising an elongated corona type tubular body in which fluid is pressurized having a planar fluid discharge end and a structured device removably secured to said elongated corona type tubular body at said discharge end and cooperating with said planar discharge end to form at least one atomizing orifice for atomizing said pressured fluid, said elongated tubular body comprising an elongated main feed conduit having a central axis and a relatively large cross-sectional area, and at least one corona discharge wing member of less cross-sectional area than the main fluid conduit extending substantially parallel with the main fluid conduit and communicating with the interior thereof, said corona discharge wing member including a corona orifice cavity having a pair of spaced side walls extending outwardly from the main feed cavity and an arcuate end wall joining the spaced sidewalls remote from said main feed cavity, said structured device having a planar surface contiguous with the planar discharge end of said elongated tubular body, said at least one atomizing orifice being formed between the planar surface of said structured device and the planar discharge end of said tubular body adjacent said arcuate end wall of said corona orifice cavity, said structured device having an outer radius which is substantially the same as the outer radius of said corona type tubular body measured from said central axis to the outside of said arcuate end wall to achieve dispersion only at the said atomizing orifice, and means securing said structured device to said discharge end whereby said structured device can be either rotated or replaced with a different structured device to achieve different rates of fluid discharge.

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**4,313,573**

## TWO STAGE COMMINUTION

**William M. Goldberger; Harold M. Epstein, and Bhupendra K. Parekh, all of Columbus, Ohio, assignors to Battelle Development Corporation, Columbus, Ohio**

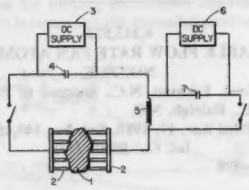
**Filed Feb. 25, 1980, Ser. No. 124,480**

**Int. Cl.³ B02C *19/18***

**U.S. Cl. 241—1** **17 Claims**

1. A method for the two stage comminution of ore which comprises

(A) applying directly to an ore sample an electric field at least equal to the pulse breakdown field of the ore and inducing a short duration electrical discharge through the ore sample and between electrodes in contact with the ore sample for a time sufficient to cause shock waves in the ore having peak pressures sufficiently high to produce reflected waves which induce tensile stresses in the ore in




excess of the tensile strength of at least one phase in the path of the reflected waves such that such phase is microfractured, and

(B) applying secondary energy to the microfractured region of the ore to enlarge the microfractures and remove portions of such microfractured ore from the remaining ore sample.

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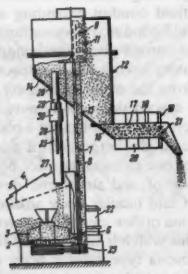
**4,313,574**

## APPARATUS FOR THE ACTIVATION OF CEMENT

**Viktor F. Rogov, ulitsa Garibaldi, 30, korpus 2, kv. 70; Igor G. Nikiforov, ulitsa Obraztsova, 24, kv. 142; Ruben A. Tatevosian, ulitsa Gorkogo, 4, kv. 60; Mikhail Y. Titov, ulitsa Kominterna, 34/6, kv. 83, all of, Moscow, and Nikolai K. Lipatov, ulitsa Mekhanizatorov, 1, kv. 4, Apatity Murmanskoi oblasti, all of U.S.S.R.**

**Filed Dec. 4, 1979, Ser. No. 100,125**
**Claims priority, application U.S.S.R., Dec. 7, 1978, 2688955**
**Int. Cl.³ B02C *19/12***
**U.S. Cl. 241—78** **9 Claims**



1. An apparatus for the activation of cement, comprising:

a receiving hopper having a crusher;

a conveying screw in a casing provided downstream said receiving hopper;

a classificr comprising a screen arranged at the outlet of said conveying screw;

at least one electromagnetic particle size reducer;

a reducer hopper for said reducer provided at the inlet of said electromagnetic reducer for a gravity feeding of cement to the latter, said reducer hopper having an inclined bottom wall and communicating with the classifier;

said screen of the classifier comprising a body of revolution which is rigidly secured to the shaft of said conveying screw coaxially with the shaft, said screen extending, together with a part of said screw with the casing in said reducer hopper upstream the inlet of said electromagnetic reducer.

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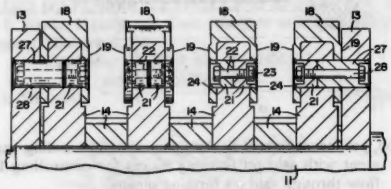
**4,313,575**

## CAPS FOR HAMMERMILL ROTORS SECURED BY INDIVIDUALLY-REMOVABLE PAIRED PIN ASSEMBLIES

**Robert M. Stepanek, Cedar Rapids, Iowa, assignor to Pettibone Corporation, Chicago, Ill.**

**Continuation-in-part of Ser. No. 883,054, Mar. 3, 1978, abandoned. This application May 21, 1979, Ser. No. 40,977**
**Int. Cl.³ B02C *13/16***
**U.S. Cl. 241—194** **12 Claims**



1. In a hammermill rotor including as environment for this improvement a row of spaced rotor arms, mounted on and rotatable by a drive shaft, swing hammers in the spaces between the arms within the row, a hammerbolt extending axially through the arms and hammers to swingably secure the hammers;

the improvement comprising caps positioned over the leading edges of the arms and having side portions extending inwardly along the side faces of the arms, said caps being secured by pin assemblies in the arms and side portions but not protruding beyond the side portions, thereby leaving the spaces between the side portions free for the swinging of the hammers; said pin assemblies including two aligned pins in one assembly separable at a cleavage plane located in the central zone of the capped arm while the pin assembly is in pinning position, and each of the aligned pins being movable from the pinning position to permit removal of the cap, and each pin assembly being reliably secure in its pinning position during operation of the rotor.

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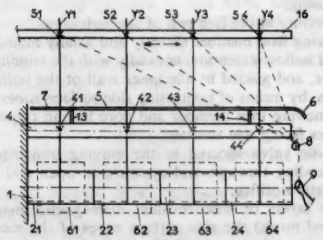
**4,313,576**

## PROCESS AND APPARATUS FOR SIMULTANEOUSLY WINDING SEVERAL YARNS

**Jean P. Claret, Lyons, and Bernard Isoard, Ecully, both of France, assignors to Rhone-Poulenc-Textile, Paris, France**

**Filed Oct. 26, 1979, Ser. No. 88,417**
**Claims priority, application France, Oct. 27, 1978, 78 31240; Sep. 18, 1979, 79 23383**
**Int. Cl.³ B65H *54/02, 54/20, 54/34***
**U.S. Cl. 242—18 PW** **16 Claims**



1. In a process for simultaneously winding each of several

yarns into separate yarn reels on yarn support tubes carried on the same spindle by bringing the yarns, each traveling in a distinct path, through a positioning guide and a reciprocating distribution guide for winding each yarn in a main winding zone on an associated yarn support tube as each yarn support tube is rotated, the improvement which comprises,

passing each yarn through its respective positioning guide;

attaching each yarn, substantially simultaneously, to an end of the spindle;

applying a force to each yarn to put each yarn out of contact with its respective reciprocating distribution guide, each yarn moving in a direction substantially parallel to the axis of the spindle under the influence of recall forces, thereby allowing each yarn to position itself on its respective main winding zone on its respective yarn support tube at approximately right angles to its respective positioning guide;

removing the force applied to each yarn to thereby allow each yarn to change its path of travel in a direction to engage with its respective reciprocating distribution guide; and,

forming a transfer end for each yarn in an attachment zone located on the yarn support tube adjacent to and outside of the main winding zone of each yarn reel by the steps of:

moving the positioning guide for each yarn to a position over the attachment zone of said yarn;

disengaging each of the yarns from its respective reciprocating distribution guide by applying a force to each of the yarns in a direction substantially perpendicular to the axis of the spindle and away from said guides;

forming a transfer end in each attachment zone at a position substantially directly below the respective positioning guides; and

withdrawing the force applied to each of the yarns and returning each positioning guide to a position above its associated main winding zone.

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**4,313,577**

## ROTARY SUPPORT FOR ROLLS OF CONVOLUTED WEBS AND MEANS FOR DAMPING ITS NATURAL FREQUENCY OSCILLATIONS

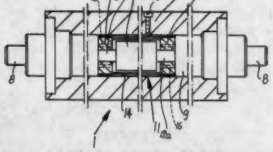
**Hartmut Peters, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany**

**Filed May 22, 1980, Ser. No. 152,183**

**Claims priority, application Fed. Rep. of Germany, Mar. 25, 1980, 3011385**

**Int. Cl.³ B65H *17/08*; F16F *15/10***

**U.S. Cl. 242—66** **15 Claims**



1. In an apparatus of convoluting or paying out convoluted webs of paper or other flexible strip material, the combination of a holder for a supply of convoluted flexible strip material; and supporting means including at least one supporting roller for the outermost convolution of said supply, said roller including a hollow rotary housing having a cylindrical peripheral surface contacting the outermost convolution of the supply on said holder, said housing exhibiting the tendency to oscillate at a given natural frequency in response to rotation of said supporting roller, and means for damping the oscillations of said housing including a dynamic damping system disposed in the interior of said housing and having a natural oscillation frequency which is attuned to said given frequency.

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**4,313,578**

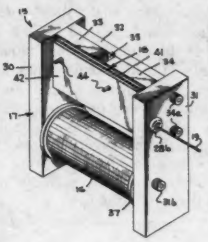
## YARN TENSION CONTROL APPARATUS

**Marlin Van Wilson, Barboursville, Va.; Lawrence C. Nickell, Fairlea, and Larry C. Nickell, Lewisburg, both of W. Va., assignors to Appalachian Electronic Instruments, Inc., Ronceverte, W. Va.**

**Continuation-in-part of Ser. No. 928,572, Jul. 27, 1978, abandoned. This application Apr. 19, 1979, Ser. No. 31,477**

**Int. Cl.³ B65H *59/22***

**U.S. Cl. 242—149** **51 Claims**

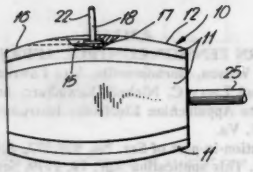


1. Yarn tensioning apparatus for tensioning a plurality of yarns being drawn from supply packages along plural yarn paths for delivery to yarn utilization apparatus such as beamers, knitting machines and the like, comprising a plurality of electronically controlled yarn tensioning devices forming a single channel of such devices regulated by a channel control voltage on a master output lead, each tensioning device comprising an electromagnet core and coil assembly to be located along each respective yarn path and including an elongated electromagnet coil and a rigid generally rectangular loop core including a U-shaped portion formed of a longitudinal cross leg extending through the coil and transverse end legs and having a pair of pole pieces extending from said end legs toward each other defining a gap therebetween for passage of magnetic flux generated by the coil through the core legs and pole pieces, the pole pieces having a pair of flat lateral mounting faces located in a single vertical plane immediately adjacent and facing the associated yarn path, a plural plate yarn wear plate assembly supported in loosely hanging relation from the pole pieces in parallel vertical planes immediately alongside said mounting faces and spanning the gap comprising a pair of inner and outer flat yarn wear plates providing confronting substantially flat coextensive vertical yarn contacting wear surfaces between which the yarn passes in frictional contact with the faces, said outer wear plate being of magnetic material to respond to variable magnetic attractive forces of the flux passing through the pole pieces to vary the force of attraction thereon inwardly horizontally toward the pole pieces and thereby vary tension of the yarn leaving the device, and electronic control circuit means remote from the yarn tensioning devices of said channel and electrically coupled through said master output lead to each of the electromagnet coils thereof for regulating the channel control voltage applied to the coils and thereby regulating the magnetic forces exerted on the wear plates.

## 4,313,579
## TWISTLESS PAYOUT PACKAGE OF FILAMENTARY MATERIAL

Bretislav P. Zuber, Montreal, and Munidas C. Pereira, Lasalle, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 10, 1980, Ser. No. 167,457
Int. Cl.[3] B65H 55/00
U.S. Cl. 242—163 11 Claims

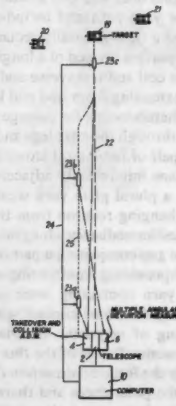



1. A method of winding an internal payout package of flexible filamentary material comprising providing a winding drum with a localized projection axially slidably received by a holding means of the drum to extend radially outwards from a winding surface of the drum in a fixed radial position relative to the drum, winding the filamentary material onto the drum to form the package, deflecting any windings which would otherwise cross the region of the projection, to one side or the other of the projection and thereby forming a radial opening by the projection through the package, and removing the package together with the projection from the drum by axial movement of the package accompanied by axial sliding removal of the projection from the holding means.

## 4,313,580
## SYSTEM FOR GUIDING REMOTE-CONTROLLED MISSILES

Hubert Collette, Neuilly-sur-Seine, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Oct. 31, 1979, Ser. No. 89,961
Claims priority, application France, Nov. 9, 1978, 78 13743
Int. Cl.[3] F41G 7/00
U.S. Cl. 244—3.13 9 Claims

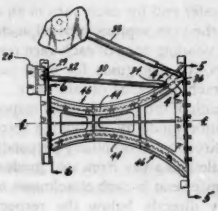



1. In a system for guiding remote-controlled missiles comprising a sighting device having an axis defining a line of sight, an angular deviation measuring (ADM) device provided with means for locating missiles in flight, and a control device (obliging) directing the missiles to follow a predetermined path in accordance with indications furnished by said ADM device, the improvement comprising means for defining a plurality of partial, individual and separate fields in the field of the ADM device, said individual fields corresponding to various zones where successive missiles may be addressed, whereby said ADM device is multiple and capable of furnishing the angular deviation information of a plurality of missiles in flight simultaneously, said control device being designed to guide, simultaneously, for at least the major part of their flight, a plurality of missiles on a plurality of distinct, predetermined standby courses spaced apart with respect to said line of sight.

## 4,313,581
## REVERSER DOOR MECHANISMS

Carroll W. Folmer, and Aldridge T. Hunter, both of San Diego, Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Sep. 12, 1979, Ser. No. 74,823
Int. Cl.[3] B64C 15/04; F02K 3/06
U.S. Cl. 244—110 B 6 Claims



1. An improved deployment mechanism for blocker doors utilized for redirecting the normal rearward fan air path of a turbo fan aircraft engine, said engine being enclosed by a two-portion nacelle, a forward nacelle portion is fixedly secured to said engine and a rearward portion being translatable by conventional translating means, a peripheral opening is provided between said portions when said rearward portion is in a translated position, said translating means comprising:

at least a pair of said blocker doors being pivotally attached to said fixed section for rotational movement between a stowed position wherein the fan air in said fan air path is unaffected to a deployed position wherein said fan air path is directed through said peripheral opening;

a yoke assembly for each pair of said blocker doors, said yoke assembly is attached to and translatable with said rearward section, the outer opposite edges of said yoke having a track therealong;

a slide member slideably engaging each of said tracks;

a first drag link pivotally attached at one end to said forward nacelle portion and at its opposite end to one of said slide members; and

a blocker door actuating link pivotally attached at one end to one of said blocker doors and at its opposite end to one of said slide members.

## 4,313,582
## DEVICE WITH INDEPENDENT HOOKS AND AUTOMATIC LOCKING MECHANISM FOR HOOKING UP LOADS UNDER AIRCRAFT

Jean H. Hasquenoph, Lagny, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, France

Filed Sep. 12, 1979, Ser. No. 74,629
Claims priority, application France, Dec. 15, 1978, 78 35346; Jan. 22, 1979, 79 01479; Apr. 20, 1979, 79 10009
Int. Cl.[3] F41F 5/02; B64D 1/02
U.S. Cl. 244—137 R 16 Claims

12. A device for releasably transporting loads under aircraft comprising:

a pair of pivoted suspension hooks adapted to co-act with

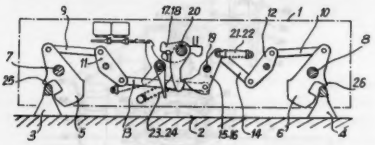
suspension members rigid with the load to be transported, each suspension hook having a closed position and a released position,

a first independent pivoting locking member associated with a first suspension hook of said pair,

a second independent pivoting locking member associated with a second suspension hook of said pair,

a first pivoting support at one end of which is pivoted said first locking member and at the other end of which is pivoted one end of a first effort scaling-down device adapted to absorb at least a main part of the force applied to the first locking member by the loaded first suspension hook,

a second pivoting support at one end of which is pivoted said second locking member and at the other end of which is pivoted one end of a second effort scaling-down device adapted to absorb at least a main part of the force applied



to the second locking member by the loaded second suspension hook,

a member connecting said first and second effort scaling-down devices in order that a movement of said connecting member in one direction puts said first and second effort scaling-down devices in an operative position whereas a movement in the opposite direction puts said first and second effort scaling-down devices in a release position, and

means for locking said connecting member in a position allowing each suspension hook to be locked in its closed position and for selectively releasing said connecting member to cause the two suspension hooks to be automatically and simultaneously placed in their released position, whereby there is applied to said locking means of the connecting member on a reduced force which avoids any risk of jamming of said locking means when actuating it to release the two suspension hooks.

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**4,313,583**

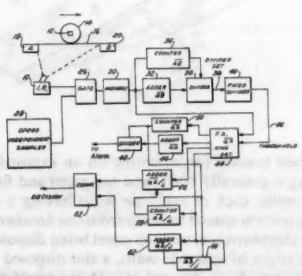
## RAILROAD CAR WHEEL BEARING HEAT SIGNAL PROCESSING CIRCUIT

**Joseph E. Bambara, North Babylon, and W. Woodward Sanville, Brentwood, both of N.Y., assignors to Servo Corporation of America, Hicksville, N.Y.**

**Filed Mar. 31, 1980, Ser. No. 135,628**

**Int. Cl.³ B61K *9/04*; G08B *21/00***

**U.S. Cl. 246—169 A** **10 Claims**



**1.** In a railroad hot box detector system of the type including infrared responsive scanner means associated with a sensing zone along a section of track adapted to scan bearings of a railroad car within said sensing zone and to generate an output voltage signal in response thereto having an amplitude and waveform indicative of the type of bearing being scanned and a sampling circuit adapted to sample the output of said scanner means into a preselected number of discrete samples the improvement comprising:

means for establishing a threshold signal level related to the average of the discrete voltage levels;

means for determining the number of discrete samples falling between the crossing points of said waveform through said threshold; and

means for averaging the discrete voltage levels of the samples falling between the crossing points whereby to obtain a signal indicative of the heat condition of the bearing being scanned.

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**4,313,584**

## STRUCTURE FOR MOUNTING A METER ON AN INSTRUMENT PANEL OF MOTOR VEHICLES

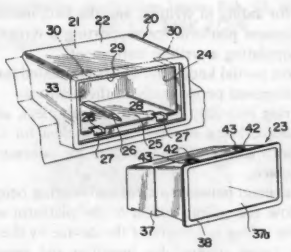
**Yukio Fukunaga, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Sep. 19, 1979, Ser. No. 77,111**

**Claims priority, application Japan, Sep. 21, 1978, 53-136270; Nov. 7, 1978, 53-116232**

**Int. Cl.³ G12B *9/00***

**U.S. Cl. 248—27.3** **12 Claims**



**1.** A structure for mounting a meter, comprising:

an instrument panel of a motor vehicle having a wall recessed in said instrument panel at the front thereof;

a meter inserted in said recessed wall through the opening of said recessed wall;

means for supporting said meter on the bottom of said recessed wall, said supporting means including a first projection formed on the front portion of the bottom of said meter, said first projection being adapted to contact the bottom of said recessed wall;

means for positioning said meter at the front portion of said recessed wall, said positioning means including:

a pair of protruding members fixedly formed at the front edge of the bottom of said meter;

means formed at the front edge of the bottom of said recessed wall for receiving said protruding members when said meter is inserted into said recessed wall;

a pair of second and third projections provided on opposite side portions of said meter; and

a pair of depressing members formed on opposite side portions of said recessed wall for depressing said second and third projections toward said receiving means;

means for locking said meter in position within said recessed wall, said locking means including a fourth projection provided on the top of said meter and an engaging member provided at the top of said recessed wall which is resiliently upwardly deformed when said engaging member becomes engaged with or disengaged from said fourth projection;

guide means including a guide provided on the bottom of said recessed wall and a groove so formed in the bottom of said

meter that said guide engages with said groove when said meter is inserted into said recessed wall; and

means for depressing said meter toward the bottom of said recessed wall when said meter is in position within said recessed wall, said depressing means including a spring member.

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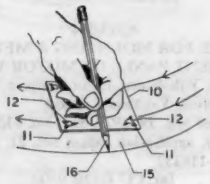
**4,313,585**

**ROLLING SUPPORT PLATFORM DEVICE FOR WRITING, DRAWING AND THE LIKE**

**Bernard L. Bricker, 14932 Northridge, Huntington Beach, Calif. 92649**

**Filed Jul. 31, 1979, Ser. No. 62,545**
**Int. Cl.³ F16M *11/26***
**U.S. Cl. 248—118.5** **3 Claims**




1. A device for aiding in writing, and the like, including:

a. a single element platform for supporting a writer's hand while manipulating a writing instrument;

b. at least three partial knock-out cleats fabricated integrally from and disposed peripherally of the platform;

c. a ball bearing rotatably disposed in each cleat, an upper bearing surface being exposed in each cleat for cleaning thereof and a lower bearing surface for contact with a writing surface;

d. frictional contact between a cleat and bearing being sufficient to slow the rolling action of the platform when in use, thereby aiding in control of the device by the writer;

e. the cleats being adapted for insertion and removal of bearings therefrom; and,

f. a handle mounted on the device for directing and lifting the platform when use.

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**4,313,586**

**UNIVERSAL EQUIPMENT LEG**

**Walter Grzesnikowski, 633 Center Ave., Cornwells Heights, Pa. 19020**

**Filed Jun. 14, 1979, Ser. No. 48,683**
**Int. Cl.³ F16M *11/24***
**U.S. Cl. 248—188.4** **13 Claims**

1. In an adjustable equipment leg, the combination of

a hollow, elongated body defining an axial bore,

the bore including an upper section and lower section,

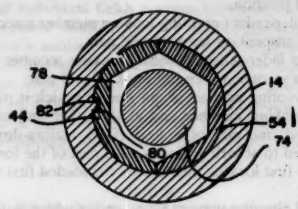
the body terminating upwardly in a widened flange;

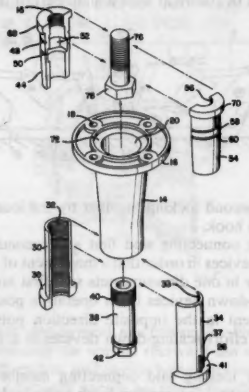
a foot adaptor assembly insertable into the body at the lower bore section thereof,

the foot adaptor assembly comprising a foot and means to axially move the foot relative to the body to vary the height of the leg; and

a replaceable bolt adaptor assembly removably insertable into the body at the upper bore section thereof,

the bolt adaptor assembly comprising a threaded stud and split adaptor means to immovably secure the stud relative to the body, the split adaptor means comprising a pair of split halves, each half having a substantially smooth outer periphery and a threaded inner periphery, the outer periphery being adapted to slide into and seat within the said upper bore section, the threaded inner peripheries being adapted to receive and tightly hold the threaded portion of the stud to form a threaded



extension for threadedly connecting the leg to a piece of equipment for equipment support.

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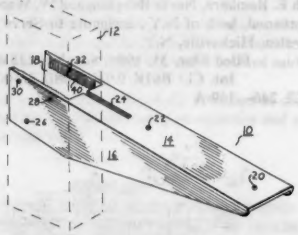
**4,313,587**

**SHELF BRACKET**

**Lester L. Loeschen, Mishawaka, Ind., assignor to Kwik-Mount Corporation, Mishawaka, Ind.**

**Filed Jul. 5, 1979, Ser. No. 54,669**
**Int. Cl.³ A47G *29/02***
**U.S. Cl. 248—217.2** **7 Claims**




1. A shelf bracket for mounting on an exposed wall stud, comprising a generally horizontal top panel and first and second side walls, each of said side walls having a rearwardly extending portion spaced laterally from one another for receiving a stud therebetween, said top panel being disposed between the upper edges of said side walls, a slot disposed in said top panel extending from the end of said top panel nearest said rearwardly extending portions of said side walls and forwardly therefrom, reinforcing members disposed on opposite sides of

said slot and joined integrally with the respective side walls and connected to the respective portions of said top panel on opposite sides of said slot adjacent said rearwardly extending side wall portions, and a plurality of spaced reinforcing members disposed between said walls forwardly with respect to said slot and joined integrally to the inner side of at least one of said side walls.

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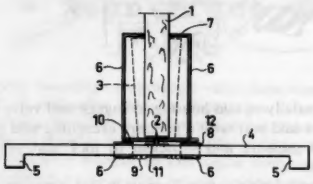
**4,313,588**

## CHRISTMAS TREE BASE OR THE LIKE

**Gunnar Sjöstrand, Motala, Sweden, assignor to R. Hagga & Soner Aktiebolag, Soderkoping, Sweden**

**Filed Mar. 10, 1980, Ser. No. 128,813**
**Claims priority, application Sweden, Mar. 15, 1979, 7902340**
**Int. Cl.³ F16M *13/00***
**U.S. Cl. 248—524** **7 Claims**




1. A Christmas tree base or similar holder of the kind where a preferably cross-shaped stand with horizontal legs forms a support against the bearer (floor), where on each leg a slidable holder is provided, which with a tubular portion encloses a leg with a certain play, and springs or the like are arranged to draw the holders to the centre of the stand, which holders are provided with upright means having hooks abutting the trunk or the like, and a central disc provided with cams corresponding in number to the legs of the stand is mounted rotatably in order upon rotation in one direction to engage the holders and to push the holders outward from the centre against the action of said springs, and upon rotation in the other direction to cause the holders to slide inward to the centre by action of said springs, characterized in that the aforesaid play between the respective tubular member and arm is so adjusted, that upon abutment of the upper end of the holder to the trunk or the like the tubular member is positioned obliquely in relation to the arm, so that the trunk effectively is retained by the substantial increase in friction arising by the friction between said member and the stand leg enclosed thereby (chest drawer effect).

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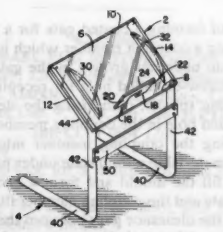
**4,313,589**

## READING DESK

**Adrian S. Vega, Sol St. No. 82, Guayama, P.R.**

**Filed Dec. 7, 1979, Ser. No. 101,512**
**Int. Cl.³ A47B *23/00***
**U.S. Cl. 248—558** **2 Claims**




1. A reading desk comprising a plate for supporting reading matter on its upper surface, and supporting means for the plate,

(a) the plate being formed of transparent material, and having parallel front and rear edges and parallel side edges, transversely extending and aligned slits in the plate adjacent its front edge, a stop member having transversely and downwardly extending aligned flat legs received in the slits and extending upwardly from the plate to provide a stop, and two elongated elastic members each adjacent one of the side edges and connected at its ends to the plate to provide a hold-down for reading matter on the plate, and

(b) means for supporting the plate in inclined position, comprising two tubular members each positioned under and connected to a side edge of the plate and having a lower part adapted to be in horizontal position in the normal use of the desk, a part which is vertical in such normal use, and a part disposed at an obtuse angle to the vertical part and which underlies and is connected to a side edge of the plate.

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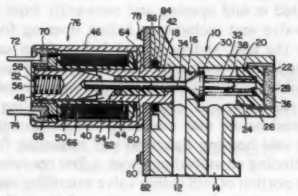
**4,313,590**

## SOLENOID VALVE FOR CONTROLLING FLOW OF FLUID

**Torazo Nishimiya, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 15, 1980, Ser. No. 121,686**
**Claims priority, application Japan, Feb. 21, 1979, 54-18326**
**Int. Cl.³ F16K *31/06***
**U.S. Cl. 251—129** **7 Claims**




1. A solenoid valve for controlling a flow of fluid, the solenoid valve comprising:

a valve body including a path for fluid to be controlled, a valve seat disposed in the path, a first cylindrical bore and a second cylindrical bore, the first cylindrical bore being opposite to the second cylindrical bore with respect to the valve seat;

an annular valve guide fitted into the second cylindrical bore;

a valve member disposed oppositely to the valve seat, said valve member having a valve shaft slidably inserted into said annular valve guide;

a yoke including an annular member fitted into the first cylindrical bore, an annular fixed core opposite to the annular member, and housing member surrounding the annular fixed core and extending in parallel thereto;

a movable core disposed oppositely to the annular fixed core;

an output shaft, one end of said output shaft being connected to said movable core and the other end thereof being engaged to said valve member through the annular fixed core and annular member; and

a cylindrical coil disposed between the annular fixed core and the housing member in coaxial relationship with the annular fixed core; and

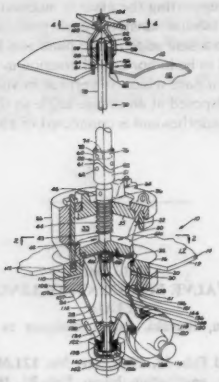
a spring disposed between said valve member and said annular valve guide, the position of said annular valve guide being adjustable in the axial direction thereof.

**4,313,591**

## COMBINATION TOP OPERABLE AND BOTTOM OPERABLE TANK LADING VALVE ASSEMBLY

**Richard J. Wempe, and Gunter R. Behle, both of St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.**

**Filed May 22, 1978, Ser. No. 908,184**
**Int. Cl.³ F16K *31/44***
**U.S. Cl. 251—144** **13 Claims**



2. A tank lading valve assembly comprising: a valve seat located in an opening in the bottom of the tank; a mounting flange located in said opening and outwardly from said valve seat; said valve seat including a lading opening for entry of lading into the tank and/or exit of lading from said tank; a lading valve located within the tank inwardly of said seat and being movable vertically between open and closed positions relative to said valve seat; a valve housing including a housing flange located below said mounting flange; fastening means connecting said housing flange to said mounting flange; said housing including an unloading spout; a first operator attached to an upper portion of said lading valve extending vertically up through the tank to the upper portion of the tank; said first operator adapted to receive a suitable handle or tool to move the lading valve vertically from a closed, seated position engaging said valve seat to an open position providing fluid communication between the interior of said tank and said housing; said lading valve further comprising means located in the lower portion of said valve for receiving and/or engaging a second operator adapted to extend at least partially through the valve housing and adapted to receive a suitable handle or tool to move the lading valve vertically between open and closed positions, whereby said lading valve may be operated from either the top or the bottom of said tank and whereby in open position lading may flow between said tank, said housing and said unloading spout.

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**4,313,592**

## BUTTERFLY VALVE

**Hendrik B. Baas, Halsteren, Netherlands, assignor to Holland Bergen op Zoom B.V. Machinefabriek en/IJzergieterij, Bergen op Zoom, Netherlands**

**Continuation of Ser. No. 55,641, Jul. 9, 1979, abandoned. This application Nov. 21, 1980, Ser. No. 209,061**
**Int. Cl.³ F16K *25/00***
**U.S. Cl. 251—162** **16 Claims**

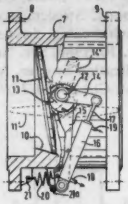
1. A butterfly valve assembly comprising, in combination:

a substantially cylindrical housing having an annular valve seat therein;

a disc-like valve member having spindle means mounting said valve member for rotational movement about an axis transverse to said housing and said valve member being dimensioned to engage around its periphery, when rotated about said axis, with said valve seat;

first actuating means for rotating said valve member in one direction about said axis between a fully open position and a closed position in which said valve member is engaged with and forced with predetermined pressure against said seat;

self-locking means for shifting said spindle means substantially axially of said housing to engage said valve member against said seat with a pressure exceeding said predetermined pressure and sufficient to lock said self-locking means;



second actuating means swingable in that direction opposite said one direction for actuating said self-locking means to shift said spindle means; and

a common actuator interconnecting said first and second actuating means.

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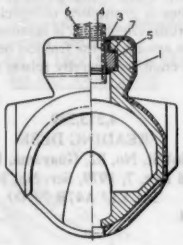
**4,313,593**

## GATE VALVES

**John W. Lambie, Kilmarnock, Scotland, assignor to Neptune Glenfield Limited, Ayrshire, Scotland**

**Filed Oct. 16, 1979, Ser. No. 85,265**
**Claims priority, application United Kingdom, Feb. 20, 1979, 06035/79**
**Int. Cl.³ F16K *3/12***
**U.S. Cl. 251—327** **2 Claims**



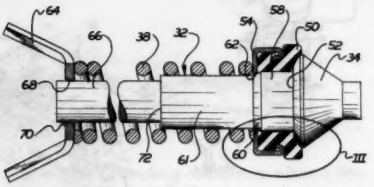
1. A method of forming a coated gate for a gate valve, the gate incorporating a coupling member which is located with a clearance fit in an undercut groove in the gate and which is formed with a screw-threaded hole for reception of a screw-threaded operating spindle, comprising the steps of plugging the screw-threaded hole in the coupling member, inserting the gate incorporating the coupling member into a mould and forcing coating material in a fluid state under pressure into the mould so as to fill the mould and form a one piece coating embracing the gate and the coupling member fitted thereto and penetrating into the clearance gaps between the adjacent faces on the coupling member and the groove in the gate thereby locking the coupling member into the gate by the coating of resilient material, removing the gate from the mould when the coating material has set and removing the plug from the screw-threaded hole in the coupling member.

4,313,594

## VALVE ASSEMBLY AND METHOD

Walter W. Antoniw, Lakewood; Richard J. Silagy, Parma, and James F. Norton, Berea, all of Ohio, assignors to Tuthill Corporation, Cleveland, Ohio

Filed Feb. 20, 1980, Ser. No. 122,859
Int. Cl.³ F16L 37/28
U.S. Cl. 251—357 14 Claims




1. A valve assembly comprising a valve stem, washer means disposed on said valve stem for engaging a valve seat, said washer means including a washer which has inner and outer side surfaces, circular retainer means for holding said washer against movement relative to said valve stem, said retainer means including a side section having opposite axial end portions and a hook portion at a first one of said axial end portions, said hook portion extending radially inwardly toward a central axis of said retainer means and axially inwardly toward a second one of said axial end portions, said hook portion having a free end which is spaced apart from said side section and is disposed at a location between said axial end portions, said washer being at least partially disposed between the free end of said hook portion and said side section, said valve stem including means for applying a force against the inner side surface of said washer to press said washer radially outwardly into the space between the free end of said hook portion and said side section.

12. A method of assembling a valve assembly, said method comprising the steps of providing a circular washer formed of a resiliently expandable material, providing a circular washer retainer having a base, a circular side wall extending axially outwardly from the base, and a hook portion which extends radially inwardly from an inner side surface of the sidewall and extends axially inwardly to a free end which is spaced from the inner side surface and is disposed between and spaced from opposite axial ends of the retainer, expanding the washer radially outwardly of the free end of the hook portion and then expanding the washer axially outwardly into the space between the hook portion and the inner side surface of the sidewall, and thereafter holding the washer in a predetermined position relative to the retainer with the hook portion by engaging the washer with the free end of the hook portion at a location spaced from and disposed between opposite axial ends of the retainer and radially inwardly of the inner side surface of the retainer.

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4,313,595

## MOUNTING BASE FOR MOTOR OPERATED VALVE

Myron D. Markley, 126 Winthrop Ter., Meriden, Conn. 06450, and Joseph M. Markley, River Rd., Essex, Conn. 06426

Filed Dec. 7, 1979, Ser. No. 101,119
Int. Cl.³ F16M 1/00
U.S. Cl. 251—369 6 Claims

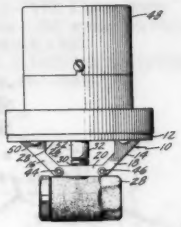
1. A mounting base for a motor operated valve, the base including:

a plate having first and second sides, said first side being adapted to mount a motor;

a mounting bracket on said second side of said plate, said mounting bracket having first and second branches extending from said second side and a bridging segment between said branches, said bridging segment being spaced from said second side of said plate and having an outer surface in predetermined alignment with said first side of said plate;

a passage in said bridging element to receive a valve stem housing;

a pair of slots in said bracket, said slots extending from said passage in opposite directions along the length of said




bridging element, said slots extending through said bridging element and into said first and second branches to divide said bridge into first and second gripping elements; and

means to urge said first and second gripping elements toward each other to lock said mounting base on a valve housing.

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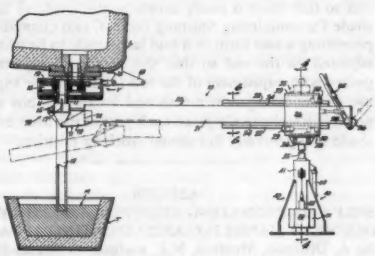
4,313,596

## SHROUD SUPPORT AND METHOD FOR SHROUD ENGAGEMENT WITH TEEMING VALVE

Patrick D. King, Rantoul, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Filed Oct. 29, 1979, Ser. No. 89,577
Int. Cl.³ C21C 7/10
U.S. Cl. 266—207 8 Claims



1. The method of fixing a shroud in pouring relationship with the lower portion of a gate valve comprising the steps of:

securing the shroud by means of a cantilever support for positioning underneath the vessel,

securely mounting the shroud in a non-pivotal relationship with the end of the cantilever support and locking the same in coaxial pouring relationship with the valve,

urging the shroud upper portion against the teeming valve by means of dead weights which are empirically determined to exert, above and beyond the tare weight of the shroud, a predetermined interfacial force between the shroud and the valve,

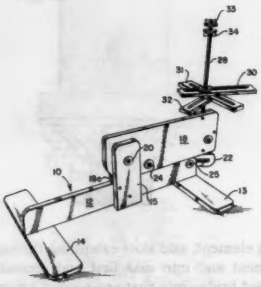
and mounting the entire unit for movement in and out of engagement with the pouring valve for lateral and longitudinal translation along an X axis, Y axis, and Z axis.

**4,313,597**

## APPARATUS FOR USE IN FABRICATING GLASS LAMPSHADES WITH LEADED JOINTS

**Orville D. Hooper, P.O. Box 1003, Petaluma, Calif. 94952**

**Filed May 27, 1980, Ser. No. 153,171**
**Int. Cl.³ B23Q *1/00***
**U.S. Cl. 269—51** **7 Claims**



1. Apparatus for use in fabricating glass lampshades by use of a form, comprising:

a support

a projecting rod having a free end, said rod being adapted to receive, for selected movement therealong from said free end and for selected rotation therearound, either a lampshade form or an internally unfinished glass lampshade after removal of the form;

swing arm means carrying said rod and swing-mounted on said support to move in a vertical plane for selectively moving said rod relative to the support to various working positions;

locking means operatively associated with said swing arm means for locking it to keep the rod in a selected working position; and

clamping means on said rod and adjustable therealong for either holding a said form sleeved on the rod with the open end of the form facing away from said free end of the rod or holding a said internally unfinished form sleeved on the rod with the open end of the lampshade facing toward said free end so that there is ready access to the inside of the lampshade for completing finishing thereof, said clamping means permitting a said form or a said lampshade to be rotationally adjusted on the rod so that this rotational adjustment together with adjustment of the rod relative to the support by use of the swing arm means and locking means makes it possible to selectively place each part of the form and lampshade in a generally horizontal working position.

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**4,313,598**

## SELF-COMPENSATING STRIPPER ASSEMBLY FOR DOCUMENT HANDLING AND COUNTING APPARATUS

**John A. DiBlasio, Medford, N.J., assignor to Brandt-Pra, Inc., Cornwells Heights, Pa.**

**Filed Aug. 29, 1979, Ser. No. 70,666**
**Int. Cl.³ B65H *3/52***
**U.S. Cl. 271—124** **25 Claims**

1. Sheet handling means comprising:

a plate for supporting a stack of sheets;

feed means for advancing sheets in a first direction;

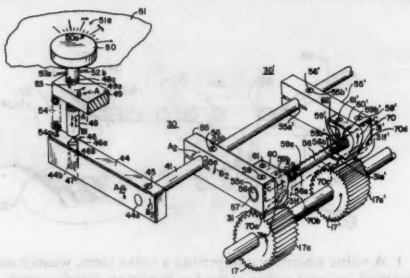
jogging means extending through said plate for advancing at least the sheet at the bottom of the stack towards said feed means;

stripper means positioned adjacent and above said feed means and normally urging sheets passing said stripper means into engagement with said feed means;

said stripper means including a first inclined surface aligned transverse to said plate for engaging the leading edges of sheets in the stack to conform to said inclined surface, and a substantially flat stripping surface and a curved surface portion between said inclined surface and said stripping surface;

means for swingably mounting said stripper means;

first bias means normally urging said mounting means in a first direction for urging said stripper means towards said feed means; and



second bias means coupled between said stripper means and said mounting means and being yieldable independently of said first bias means to enable said stripper means to swingably move upon said mounting means to be displaced from said feed means by sheets passing between said stripper means and said feed means.

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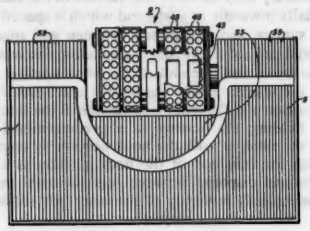
**4,313,599**

## STACK TRAY FOR SHEET SEPARATOR

**S. Warren Lohr, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Oct. 3, 1979, Ser. No. 81,498**
**Int. Cl.³ B65G *1/06, 3/48***
**U.S. Cl. 271—166** **2 Claims**



1. A bottom sheet separator-feeder for separating and feeding sheets seriatim from a stack of sheets comprising;

a stack tray adapted for supporting a sheet stack, the top surface of said tray having a plurality of parallel striations formed therein,

feed means, associated with said tray adapted to separate and feed sheets individually from the sheet stack; and

air injection means disposed along the leading edge of said tray, said air injection means being positioned and adapted to provide a flow of air in direct communication with and parallel to all of said striations between the top surface of said tray and the underside of the bottom sheet in the sheet stack, said striations encouraging laminar flow of air over said tray to minimize turbulence and increase the lifting efficiency of the air injection means.

4,313,600

## SHEET STACKING METHOD AND APPARATUS

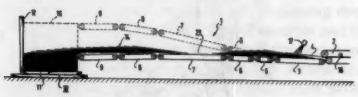
Hans Mosburger, Weiherhammer, Fed. Rep. of Germany, assignor to BHS-Bayerische Berg- Hutten- und Salzwerke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 3, 1979, Ser. No. 99,701

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1978, 2852603

Int. Cl.³ B65H 5/34

U.S. Cl. 271—203 9 Claims



1. In a method for the stacking of sheets in which a flow of sheets overlapping like scales is fed by a removal conveyor belt from a sheet feed conveyor belt to a stacking station, the invention comprising the steps of:

increasing the speed of the removal conveyor belt relative to the feed conveyor belt to form a gap in the flow of sheets; and

lifting a portion of the sheet flow upstream of the gap away from the removal conveyor belt by advancing a lifting belt having louver strips to interpose the louver strips between the removal conveyor belt and said portion of the sheet flow upstream of the gap and the lifting belt conveying said portion at the same speed as the feed conveyor belt.

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4,313,601

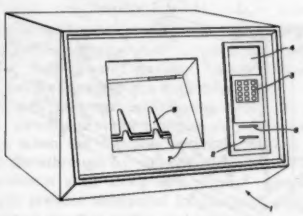
## AUTOMATIC BANKING MACHINE WITH SEALED TAMPER-INDICATING CONTAINER FOR RECEIVING AND STORING DIVERTED PAPER MONEY BILLS

Harry T. Graef, Dover; Scott A. Mercer, Hanoverton; Jeffrey A. Hill, North Canton, all of Ohio, and Spiro Leontas, Hesperia, Calif., assignors to Diebold Incorporated, Canton, Ohio

Filed Jul. 9, 1980, Ser. No. 167,212

Int. Cl.³ B65H 31/00

U.S. Cl. 271—207 8 Claims



1. In a cash dispensing automatic banking machine having a conveyor which transports paper money bills diverted from the normal path of travel to a conveyor divert discharge station, the combination of a container having walls forming a bill-receiving opening provided with a closure lid; lock means mounted on a container wall having bolt means located inside the container cooperatively connected with the closure lid for moving the closure lid from closed to open position as the bolt means is actuated from locked to unlocked mode, and vice-versa, and the lock means having a key opening accessible exteriorly of the container; key means including a key for the lock means movably mounted on and sealed to the banking machine; means for mounting and retaining said container in position on the banking machine oriented to telescopically receive in said key opening said key for unlocking said lock means, and when so oriented to locate the container opening and its said closure lid adjacent to said conveyor divert discharge station; and shroud means mounted on the banking machine protectively enclosing said conveyor divert discharge station and said container opening and closure lid when the container is in retained oriented position.

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4,313,602

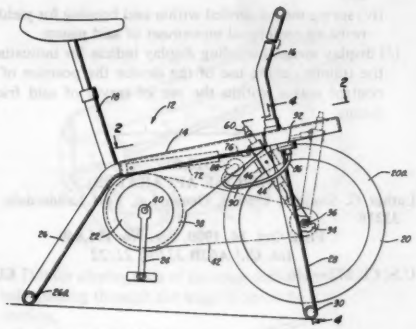
## CYCLE-TYPE EXERCISER

James P. Sullivan, Tustin, Calif., assignor to Marcy Gymnasium Equipment Co., Alhambra, Calif.

Filed Feb. 5, 1980, Ser. No. 118,756

Int. Cl.³ A63B 21/00

U.S. Cl. 272—73 4 Claims



1. An exercise device for use by a trainee to simulate riding of a bicycle, comprising:

(a) a supporting frame including a rearwardly disposed, downwardly depending support member and a forwardly disposed support member having downwardly depending spaced apart fork-like members;

(b) an axle carried by said fork-like members and extending therebetween;

(c) a wheel rotatably carried by said axle intermediate said fork-like members;

(d) handle bars attached to said frame;

(e) a seat attached to said frame in a rearwardly spaced relation to said handle bars;

(f) a rotatable shaft carried by said frame and operably interconnected with said wheel whereby rotation of said shaft will impart rotational forces to said wheel;

(g) pedal cranks attached to said shaft for rotation therewith said pedal cranks being engageable by the feet of the trainee to impart rotational movement to said shaft;

(h) resistance imparting and indicating means for imparting vehicle resistance against rotation of said wheel and simultaneously indicating to the trainee the degree of resistance against performance of the exercise which is being experienced said resistance imparting and indicating means comprising:

(l) friction means carried by said axle and rotatable with respect thereto throughout a prescribed arc, said friction means being adapted to controllably impede the rotation of said wheel, said friction means comprises:

(i) a generally "U" shaped frame having a bight portion and a pair of spaced apart legs adapted to straddle said wheel and being connected to said axle proximate their lower extremities;

(ii) a pair of friction members carried by said legs in close proximity to the outer periphery of said wheel, one of said friction members being stationarily attached to one leg of said U-shaped member and the other of said friction members being movable relative to said wheel;

(iii) lever means connected at said bight portion of said "U" shaped frame and adapted for moving said other friction member into engagement with said wheel;

(iv) control means operably associated with said lever

means and operable by the trainee to cause movement of said lever means to controllably move said friction member into engagement with said wheel; and

(2) biasing means carried by said supporting frame and operably interconnected with said friction means for yieldably resisting rotation of said friction means throughout said arc, said biasing means comprising:

(i) an elongated housing;

(ii) a piston closely receivable within said housing and reciprocally movable therewithin;

(iii) a piston rod having one end connected to said piston and the opposite end connected to said pad support bar; and

(iv) spring means carried within said housing for yieldably resisting reciprocal movement of said piston;

(3) display means including display indicia for indicating to the trainee during use of the device the position of said control means within the arc of travel of said friction means.

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**4,313,603**

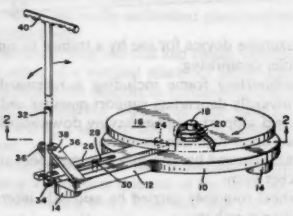
**EXERCISE APPARATUS**

**Luther G. Simjian, 1750 S. Ocean La., Fort Lauderdale, Fla. 33316**

**Filed Oct. 14, 1980, Ser. No. 196,849**

**Int. Cl.³ A63B *23/04, 21/22***

**U.S. Cl. 272—146** **7 Claims**



**1.** An exercise apparatus comprising:

a stationary support;

a platform mounted upon said support for reciprocating rotating motion and adapted to support a person;

an upstanding post mounted forward of the perimeter of said platform and pivotally supported by said support for enabling the upper end of said post to undergo reciprocating motion in a direction generally toward and away from said platform, and

means which include a slide mounted for reciprocating linear motion, said slide coupled by pin and groove means at one end to said platform and coupled at the opposite end to the lower end of said upstanding post, for causing said upper end of said post to undergo said reciprocating motion responsive to reciprocating rotating motion imparted to said platform.

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**4,313,604**

**GOLF TEE AND BALL STICK DEVICE**

**G. Matthews Baxter, 589 Sheridan Rd., Glencoe, Ill. 60022**

**Filed Jan. 2, 1980, Ser. No. 109,152**

**Int. Cl.³ A63B *57/00***

**U.S. Cl. 273—32 A** **21 Claims**

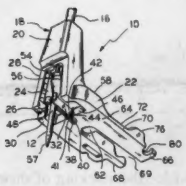
**1.** In a stick device for use with a golf tee and ball and comprising a handle attached to a head, said head including:

a spring having a pair of fingers which spread apart to an open position from a closed position for receiving the tee and thereby resiliently clamping the tee in place, and said fingers returning to the closed position after the tee is disengaged from the spring upon the application of a lateral force to the handle, said spring receiving the tee prior to inserting the tee in the ground; and

contacting member spaced above said spring and in a fixed position for providing an abutting surface for the top of the tee when the tee is inserted in the ground upon the application of a downward force to the handle.

**21.** In a stick device for use with a golf tee and ball and having a handle attached to a head, said head including:

a body portion;



a pair of tongs extending out from said body and spaced apart, each of said tongs including a forward hump, a shoulder and a ledge between said hump and shoulder, each of said humps including a forward curved portion for rolling said tee over said humps and on to said ledges; and

a notch formed in one of said ledges, said notch being dimensioned less than the diameter of the top of the tee for receiving the neck of the tee between the top and stem of the tee for pulling the tee out from the ground.

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**4,313,605**

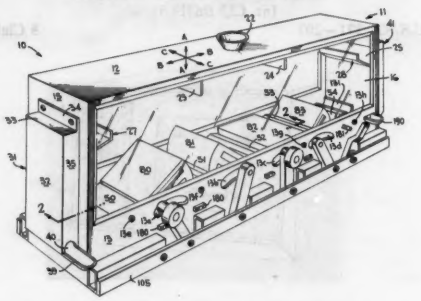
**COMPETITION GAME MACHINE**

**W. Fred Stokes, Rte. 2, Branchville, S.C. 29432; Fairey S. Bradford, 909 4th Ave., Kingstree, S.C. 29556, and Nancy S. Strobel, 901 Wisteria Dr., Florence, S.C. 29501**

**Filed Sep. 5, 1980, Ser. No. 184,467**

**Int. Cl.³ A63F *7/06, 7/10***

**U.S. Cl. 273—85 C** **9 Claims**



**1.** A competition game machine which comprises,

(a) an elongated housing formed by a cover member, two side members, two end members and a bottom member, said side members including openings therein in which are mounted window elements; said cover member including an opening in the center thereof to allow a game ball to be dropped into said housing, each of said side members including at least two crescent-shaped slots therein, the crescent-shaped slots in one side member being transversely aligned with the crescent-shaped slots in the other side member, said side members also including transversely aligned bottom openings therein near the lower sides thereof, and each of said end members including an opening in the upper portion thereof which is sufficiently sized to allow a game ball to pass therethrough,

(b) identical game ball return means mounted on the outer

sides of each respective end member and capable of receiving a game ball passing through the opening in the respective end member,

(c) at least three transversely extending flooring panels mounted in said housing in spaced apart fashion between said housing end members, the upper portions of said flooring panels forming segments of a game ball playing deck surface above the housing bottom member,

(d) separate identical projector elements positioned near the opposite end members of the housing, each projector element including a transversely extending curved head portion which, when the projector element is in its rest position, will form a segment of the playing deck surface between the adjacent housing end member and the nearest flooring element, and which, when the projector element is operated, will project a game ball therein towards the opposite end member of the housing, each projector element also including a rotatable projector shaft to which the curved head portion is connected, said rotatable projector shaft extending through transversely aligned bottom openings in said housing side members and having a handle means attached near one end thereof outside said housing to allow for manual gripping thereof and rotation of said rotatable projector shaft, the handle means of the separate projector elements being on the outer sides of opposite side members,

(e) at least two separate and identical activator elements positioned in the housing between said separate projector elements, each said activator element including a transversely extending rotatable contact member which forms a segment of the playing deck surface between adjacent flooring panels and, when rotated, acts to control the movement of a game ball in contact therewith, each activator element also including a yoke having two arms and a cross bar connecting first ends of said arms, said cross bar being rotatably mounted in aligned bottom openings in said housing side members, the second ends of said arms including aligned bores through which extends a rotatable activator shaft, each said rotatable activator shaft extending through and being translatable within transversely aligned crescent-shaped slots in said housing side walls and including a knob rotatably connected near one end at a point outside of said housing, the knobs on adjacent activator elements being on the outer sides of opposite side members, the contact member of each activator element being mounted around a center portion of the associated rotatable activator shaft between said housing side members, said contact member having control means connected between opposite ends thereof and the adjacent housing side members, said control means allowing said contact member to rotate along an axis transverse to said housing when the rotatable activator shaft is slidingly moved therethrough by manual translation of the rotatable activator shaft along said aligned crescent-shaped slots, yet prevent substantial longitudinal movement of said contact member within said housing.

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**4,313,606**

## BASEBALL GAME APPARATUS

**Young S. Ham, 333-80, Songsu 2-Ka 1-dong, Songdong-Ku, Seoul, Rep. of Korea**

**Filed Sep. 2, 1980, Ser. No. 183,008**
**Int. Cl.³ A63F** *7/06, 7/10*
**U.S. Cl. 273—89** **7 Claims**

1. Baseball game apparatus comprising:

a body having an upper board (**2**) and a bottom board (**2'**), the upper board (**2**) having foul ball collecting side openings (**2*a*** and **2*b***) extending along both sides, the bottom board (**2'**) being sloped to direct balls falling on the bottom board through the foul ball collecting side openings to a ball collecting portion (**2*c***) of the bottom board, the upper board (**2**) having a slot (**3**) positioned near one end thereof;

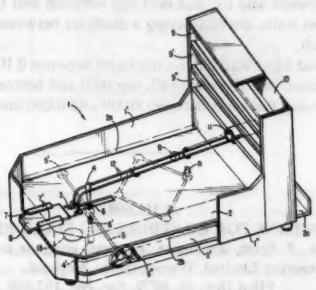
a bat supporting bar (**5**) rotatably supported by sides of the body;

a bat having hitting portions (**4** and **4'**) supported by the bat supporting bar (**5**);

coil springs (**6** and **6'**) for interconnecting the hitting portions and supporting bar;

a handle (**5''**) connected to the bat supporting bar (**5**) for rotating the bat;

three open stage fields (**9**, **9'** and **9''**) connected to an end portion of the body spaced furthest from said slot;



a net (**10**) for closing ends of the stage fields and for directing balls passing through the stage fields to the ball collecting portion;

a ball pitching hole (**11**) formed in, and extending through, one of the stage fields; and

ball guide rail means (**12**) extending downwardly from the ball pitching hole (**11**) to the slot (**3**) for guiding a rolling ball (**B**) past a position in which the rolling ball is hittable by rotation of the bat.

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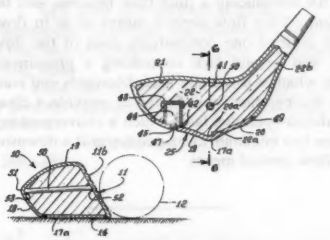
**4,313,607**

## REINFORCED METAL SHELL GOLF CLUB HEAD, WITH KEEL

**Stanley C. Thompson, 7851 Talbert St., Apt. 1, Playa del Rey, Calif. 90271**

**Continuation-in-part of Ser. No. 170,957, Jul. 21, 1980. This application Nov. 17, 1980, Ser. No. 207,654**
**Int. Cl.³ A63B** *53/04*
**U.S. Cl. 273—167 H** **19 Claims**



1. A reinforced metallic shell golf club head, comprising

(a) a thin steel shell having the exterior form of said head, the shell extending about a hollow,

(b) the head having a front wall with a front face adapted to strike a golf ball, said front wall having a mid-portion, and other wall structure rearward of a plane defined by said face, said other structure including a thin rear wall which is rearwardly convergent both generally vertically and generally horizontally to form a rearwardmost local concavity facing directly forwardly toward said front wall

mid-portion, said concavity having the form of a corner in a rearwardly extending vertical plane,

(c) and a strut in the form of a steel rod extending in said hollow from the rear side of said front wall mid-portion to the front side of the said rear wall at said local concavity to transmit loading therebetween in response to said ball striking said front face, thereby to resist deformation of said front wall, the entirety of the rod confined within said hollow,

(d) said other wall structure including a toe and heel, and top and bottom walls, the rod generally centrally located between said toe and heel and between said top and bottom walls, the rod having a diameter between 3/32 and ¼ inch,

(e) said front wall having thickness between 0.105 and 0.125 inches, and the rear wall, top wall and bottom wall each having thickness between 0.030 and 0.050 inches.

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**4,313,608**

## MEANS FOR CONTROLLING FLUID FLOW

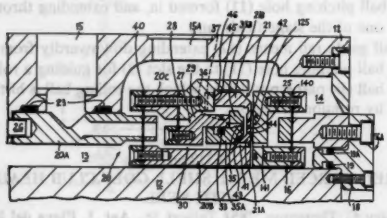
**Peter A. J. Scott, Brighouse, England, assignor to Associated Engineering Limited, Warwickshire, England**

**Filed Dec. 12, 1979, Ser. No. 102,609**

**Claims priority, application United Kingdom, Dec. 20, 1978, 49338/78**

**Int. Cl.³ F16J *15/34***

**U.S. Cl. 277—27** **11 Claims**



1. Means for controlling fluid flow over the rear annular face of a working element of a rotary device, comprising a second annular face opposed to, non-rotatable relative to and cooperating with said rear face to define a fluid flow passage, and means for introducing a fluid flow between said faces at an inlet zone of the flow control means so as to flow radially towards at least one downstream zone of the flow control means, said second face comprising a pressure-deflectable element which is elastically loaded towards said rear face and which, in operation, is deflected to provide a clearance between the co-operating faces which is convergent in the radial direction to a minimum clearance towards a downstream zone of the flow control means.

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**4,313,609**

## SEALING DEVICES

**Harold J. Clements, 20 St. Michaels Close, Canterbury, Kent, England**

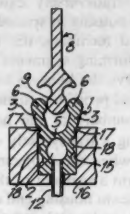
**Filed Jul. 14, 1980, Ser. No. 168,499**

**Claims priority, application United Kingdom, Jul. 16, 1979, 24673/79**

**Int. Cl.³ B65D *53/04*; F16J *15/02***

**U.S. Cl. 277—34.3** **9 Claims**

1. A sealing device comprising two interengageable elongate seal members, of which at least one is flexible and has an internal void extending along the length thereof, said one member having a recess which is arranged to deform so as sealingly to



engage the other seal member when said void is at least partially evacuated with the seal members interengaged.

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**4,313,610**

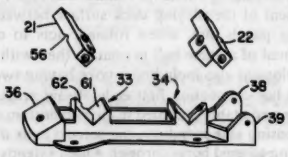
## CARRIAGE FOR ROLLER SKATES

**Anthony J. Volk, P.O. Box 943, Turlock, Calif. 95380, and George L. Volk, Turlock, Calif., assignors to Anthony J. Volk, Turlock, Calif.**

**Filed Mar. 6, 1980, Ser. No. 127,900**

**Int. Cl.³ A63C *17/02***

**U.S. Cl. 280—11.28** **8 Claims**



1. A roller skate truck comprising

an elongated body having a pair of depending longitudinally-spaced mounting blocks with V-shaped under surfaces, with the surfaces adjacent the ends of said body having convex configurations laterally thereacross,

a pair of axle elements adapted to receive wheel axles longitudinally thereof and each having a concave depression laterally thereacross for engaging the convex mounting block surfaces, and

mounting means including bolts adapted to extend through said axle elements and mounting blocks with resiliently compressible elements thereabout for accommodating limited pivoting of said axle elements by shifting of the concave-convex engagement of mounting block and axle element.

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**4,313,611**

## SULKY HAVING ADJUSTABLE FULCRUM POINT

**Frank D. Heinze, Jr., Freehold, N.J. 07728, and Frank D. Heinze, III, Manasquan, N.J. 08736**

**Continuation of Ser. No. 44,482, Jun. 1, 1979, abandoned, which is a continuation of Ser. No. 852,475, Dec. 5, 1977, abandoned. This application Nov. 12, 1980, Ser. No. 206,241**

**Int. Cl.³ B62C *1/08***

**U.S. Cl. 280—63** **7 Claims**

1. A dual-wheeled horse drawn sulky including an inverted generally U-shaped frame member having a pair of rearwardly and downwardly extending parallel shaft portions to receive a horse therebetween, said shaft portions having an outboard strut at each end, a pair of transversely aligned wheel axles, one positioned between each of said shaft portions and respective outboard strut, a rearwardly inclined arched member having a pair of forwardly extending portions interconnected

at their rear ends by a bight portion, each of said forwardly extending portions being hingedly secured at the forward terminus to a respective one of said shaft portions, a first clamp means secured along each of said forwardly extending portions, a pair of forked members, each of said forked members

being hingedly secured at the upper portion thereof with respect to a respective one of said first clamp means, the lower ends of said forked members being hingedly connected to the lower portion of said shaft portions, a driver's seat centrally located at said bight portion of said arched member.

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**4,313,612**

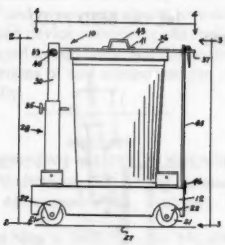
## CONVERTIBLE TRASH CONTAINER CARRIER

**Robert A. Rubens, Rte. 4 Box 895, Sequim, Wash. 98382**

**Filed Feb. 20, 1980, Ser. No. 122,885**

**Int. Cl.³ B62B *3/02***

**U.S. Cl. 280—79.1 A** **23 Claims**



1. A trash container carrier, which comprises:

a pallet for supporting a trash container and lid having a top surface, front and rear end, a rail projecting downwardly from the sides and a small opening extending through the floor of the pallet adjacent to each corner,

a wheel assemblage secured to the longitudinal sides of each opening for supporting said pallet above a ground surface,

connecting means adapted to removably mount the wheel assemblage inside said opening,

a first upright member secured at a lower end to the floor adjacent of the rear end of said pallet intermediate of the side rails and having an upper end area cut-out for a rotatable connection,

an arm extending along the longitudinal axis of said floor having an inner end formed for rotatable communication with the upper end of the first upright member, and including a pair of spaced apart holes through the arm intermediate the inner and outer ends,

connecting means for attaching the lid to the holes in said arm,

hinge means adapted to rotate said inner end of said arm about the cut-out area in said upper end of said first member,

a second upright member rotatably fastened at a bottom end to said floor adjacent to said front end in alignment with said first member and having an opening adjacent to the top end to receive a portion of the outer end of said arm therethrough in locking engagement.

**4,313,613**

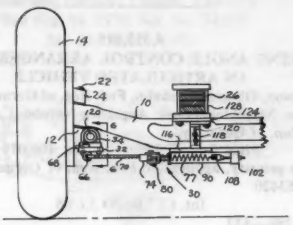
## STEERING STABILIZER STRUCTURE FOR THE FRONT WHEELS OF A VEHICLE

**Doyle H. Worsham, P.O. Box 231, Boaz, Ala. 35957**

**Filed Dec. 7, 1979, Ser. No. 102,103**

**Int. Cl.³ B62D *7/08***

**U.S. Cl. 280—94** **11 Claims**



1. Steering stabilizer structure for the steering wheels of a heavy duty vehicle designed to be affixed beneath each extremity of the axle thereof and attached to the wheel steering arms at the steering knuckles, said structure including a wheel camber plate adapted to be located adjacent the underside of the steering knuckle sleeve and disposed longitudinally of said vehicle, means for securing said camber plate to the steering arm, a recovery bar spaced inwardly of said camber plate and at least a pair of spaced apart flexible connection means extending between said bar and plate, said camber plate having a fulcrum recess for the wheel kingpin, said recovery bar having a fulcrum pin aligned with said fulcrum recess and adapted to underlie the vehicle axle, a mounting member having means for fixed attachment to the underside of the vehicle axle, first spring means connected between said mounting member and said fulcrum pin and adapted to be aligned with said kingpin and fulcrum pin and urging said recovery bar away from the wheel in a direction underlying and parallel to the vehicle axle, and at least a pair of second spring means connected one on each side of said first spring means between said mounting member and recovery bar urging the recovery bar away from said camber plate, whereby turning movement of the vehicle wheel will move the recovery bar away from the mounting member and toward the wheel and will be resisted by said first spring means and said second spring means.

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**4,313,614**

## SKI AND ITS MANUFACTURE

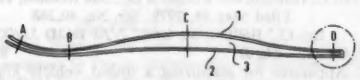
**Hans Woitschatzke, Grunwald, and Hennoch Geyer, Munich, both of Fed. Rep. of Germany, assignors to Trak Incorporated, Ward Hill, Mass.**

**Filed Jun. 18, 1979, Ser. No. 49,426**

**Claims priority, application Fed. Rep. of Germany, Jun. 26, 1978, 2827954**

**Int. Cl.³ A63C *5/12***

**U.S. Cl. 280—610** **8 Claims**



1. An improved ski, which ski comprises an upper surface material and a spaced-apart, lower, gliding surface material, the upper and lower surfaces separated by a core filler material, the ski having a tip at the one end and a tail end at the other end, the improvement which comprises a single, coherent, continuous piece of bonded material extending longitudinally substantially the length of the ski and about the core material, to form the upper and lower surface material of the

ski, and about the tail end of the ski, to form an integral, continuous, rear-end, tail guard of the bonded material in the general cross-sectional form of a U shape, the bonded material at the rear tail end characterized by areas of reduced thickness of the bonded material about the upper and lower corner areas of the rear-end tail guard, thereby providing an improved ski with an integral, continuous guard about the core material at the rear tail end of the ski.

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**4,313,615**

## BUCKLING ANGLE CONTROL ARRANGEMENT FOR AN ARTICULATED VEHICLE

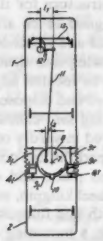
**Klaus Simon, Oberschleissheim, Fed. Rep. of Germany, assignor to Man Maschinenfabrik Augsburg-Nurnberg AG, Munich, Fed. Rep. of Germany**

**Filed Dec. 4, 1979, Ser. No. 100,079**

**Claims priority, application Fed. Rep. of Germany, Dec. 11, 1978, 2853420**

**Int. Cl.³ B62D** *53/06*

**U.S. Cl. 280—432** **6 Claims**



1. A buckling angle control arrangement for the front and trailing members of a vehicle joined by an articulation having a pivot axis, the front member of the vehicle having a steering mechanism, the control arrangement comprising:

(a) an element pivotable about the pivot axis of the articulation between the vehicle members,

(b) a linkage pivotally interconnecting said element and the steering mechanism of the front vehicle member, the linkage connection being such that the steering mechanism and pivotable element rotate in opposite directions,

(c) two hydraulic cylinder and piston assemblies arranged on opposite sides of the articulation between the vehicle members, each assembly being between the two vehicle members, and

(d) means responsive to the angular position of said pivotable element and the buckling angle between the vehicle members for controlling hydraulic fluid communication between said cylinder and piston assemblies to limit the buckling angle between the vehicle members.

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**4,313,616**

## SPEED RESPONSIVE TRAILER STABILIZER WITH ZERO SLACK

**Durrell U. Howard, 306 Krameria Dr., San Antonio, Tex. 78217**

**Filed May 18, 1979, Ser. No. 40,268**

**Int. Cl.³ B60D** *1/00;* **B60T** *7/20;* **B62D** *53/00*

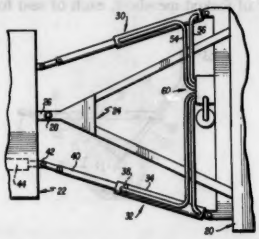
**U.S. Cl. 280—446 B** **81 Claims**

1. Apparatus for stabilizing a towed vehicle joined to a towing vehicle by a towing connection permitting said vehicles to turn relative to each other about a yaw axis, said apparatus comprising:

turning resistance means for at times providing a resistance to said relative turning movement between said towed and towing vehicles about said yaw axis;

coupling means for mechanically transmitting the turning resistance provided by said turning resistance means to said towed and towing vehicles;

and extensible means for biasing said towed vehicle away from said towing vehicle such that tension is placed on said towing connection and substantially all slack is removed from said towing connection and from said coupling means whereby even slight relative turning movement between said towed and towing vehicles about said yaw axis is resisted by said turning resistance means.



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**4,313,617**

## CAMBER ADJUSTING DEVICE IN STRUT TYPE SUSPENSION SYSTEM

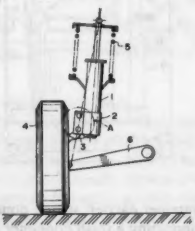
**Tadao Muramatsu, and Yasuhiko Ichihashi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Mar. 7, 1980, Ser. No. 128,082**

**Claims priority, application Japan, Mar. 28, 1979, 54-41177[U]**

**Int. Cl.³ B62D** *17/00*

**U.S. Cl. 280—661** **3 Claims**



1. A camber adjusting device in a strut type suspension system having a substantially vertically extending strut and a steering knuckle connected to each other through a support bracket, wherein:

the support bracket having a substantially vertically extending axially elongated slot and a through hole at opposite ends thereof, said bracket being fixedly secured to said strut;

one end of the steering knuckle having two holes at positions corresponding to said slot and said hole of the support bracket;

a first clamp means extending through the slot of the support bracket and one of the holes of the end of the steering knuckle and clamping the support bracket and the steering knuckle;

a second clamp means extending through the hole of the support bracket and the other one of the holes of the end of the steering knuckle and clamping the support bracket and the steering knuckle;

a manually rotatable eccentric adjustment piece on said first clamp means and extending through the one of the holes of the steering knuckle;

whereby upon manual rotation of the adjustment piece it forces the steering knuckle to pivot the support bracket about the second clamp means and at the same time the

first clamp means is moved substantially vertically along the elongated slot.

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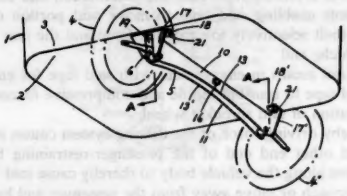
4,313,618

## RESILIENT SUSPENSION MEANS FOR LIGHT VEHICLES

Russell S. Robinson, 3330 N. Webster Pl., Tucson, Ariz. 85715

Filed Jan. 28, 1980, Ser. No. 115,682
Int. Cl.³ B60G 11/02
U.S. Cl. 280—688 3 Claims



1. In a vehicle having a body and oppositely disposed wheels, a resilient suspension comprising

a flexurally resilient axle component disposed transversely across said body, the center of said component being connected to said body, and each end of said component having an axle shaft extending outside the sides of said body and adapted to rotatably support a wheel,

and a device connected to said body which restrains the outer ends of said component against forward or rearward movement, said device comprising channel means having a web connected to said body, and flanges between which the outer portions of said component can move substantially vertically.

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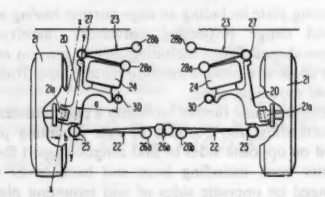
4,313,619

## INDEPENDENT WHEEL SUSPENSION

Gottfried Hailer, Waiblingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 9, 1980, Ser. No. 148,284
Claims priority, application Fed. Rep. of Germany, May 9, 1979, 2918605
Int. Cl.³ B62D 7/16
U.S. Cl. 280—691 26 Claims



1. An independent wheel suspension arrangement for vehicles having wheels supported by a wheel carrier, the arrangement comprising a pair of control arms arranged in a superimposed relationship, and a wheel suspension means supported on the wheel carrier, characterized in that a ball and socket means is provided for articulatingly connecting each control arm to the wheel carrier, at least one additional moment supporting arm is provided for supporting the wheel carrier with respect to a body of the motor vehicle against a twisting about a substantially perpendicular axis of rotation defined by the ball and socket means, and in that further ball and socket means are provided for connecting a first end of the moment arm to the wheel carrier and a second end of the moment arm to the body of the vehicle.

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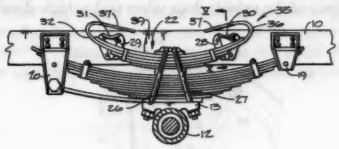
4,313,620

## DEVICE FOR LIMITING LATERAL CANTING OF ROAD VEHICLES

Fred Posnikoff, c/o Summit Spring Service Ltd., 198 Welland Ave., St. Catharines, Ontario, Canada L2R 2P3

Filed Sep. 10, 1979, Ser. No. 74,032
Int. Cl.³ B60T 11/02
U.S. Cl. 280—718 3 Claims



1. A road vehicle suspension system including, in combination:

(a) an elongated frame and a wheel axle;

(b) means for securing said axle to said frame comprising main spring means of the type of a semi-elliptical laminated first leaf spring fixedly secured to the axle, each end of the main spring means being secured to a respective main spring bracket means, each main spring bracket means being secured to the frame to maintain a flexible but permanent connection between the opposing ends of the main spring means and the frame at any instant state of compression or rebound of said main spring means;

(c) auxiliary spring means of the type of a semi-elliptical laminated second leaf spring separate from said first leaf spring and fixedly secured to said axle, each end of said second leaf spring being disposed below and spaced from a respective auxiliary spring bracket fixedly secured to the frame, the upper side of the opposing ends of the auxiliary spring means being adapted to engage the underside of said auxiliary spring brackets only when the deflection of said main spring means exceeds a predetermined value;

(d) said auxiliary spring brackets being separate from and independent of the main spring bracket means and being spaced from each other a distance shorter than that between said main spring bracket means;

(e) said auxiliary spring means including an anti-tilt spring leaf having inwardly turned ends which are spaced from the frame and from the auxiliary spring brackets, the uppermost portions of said inwardly turned ends being normally disposed above and freely spaced from the upper sides of the respective auxiliary spring brackets, the lower surfaces of the uppermost portions of the inwardly turned ends of said anti-tilt spring leaf being engageable only with said upper sides of the respective auxiliary spring brackets when said frame exceeds a predetermined tilt in a direction transverse to the direction of elongation of said frame.

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4,313,621

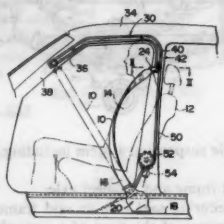
## SEATBELT SYSTEM

Yuji Nishimura, Nagoya, and Tatsushi Kubota, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai Rika Denki Seisakusho, both of Aichi, Japan

Filed Nov. 1, 1979, Ser. No. 90,405
Claims priority, application Japan, Nov. 10, 1978, 53-154794[U]
Int. Cl.³ B60R 21/10
U.S. Cl. 280—804 5 Claims

1. A seatbelt system, wherein an occupant restraining webbing is automatically fastened to an occupant after said occupant enters a vehicle, comprising:

(a) a guide rail in which the central portion thereof is laid on a roof side of the vehicle in the substantially horizontal direction and the rear end portion thereof is made to hang down vertically along a center pillar of the vehicle;
(b) a slider engaging an outer end portion of an occupant restraining webbing, being guided by said guide rail, and being moved from a webbing automatically fastening position disposed in the rear end portion of said guide rail to an unfastening position disposed in the forward end portion of said guide rail;
(c) a door checker projected outwardly from the vehicle and adapted to be pushed into the vehicle body by a closing force of the vehicle door when said vehicle door is closed;



(d) a slide piece disposed in the center pillar, connected to said door checker, and moved laterally of the vehicle by said door checker; and
(e) a locking plate secured to said slide piece and projected into the moving path of the slider by a resilient member confined between the slide piece and the locking plate, the projecting end of which is of a triangular shape and abuts against the slider when the slider is moved to the automatically fastening position, whereby said resilient member is flexed to allow the locking plate to go out of the moving path of the slider, so that the slider can be prevented from moving from the automatically fastening position to the unfastening position, thereby reliably restraining the occupant even when the vehicle is turned over.

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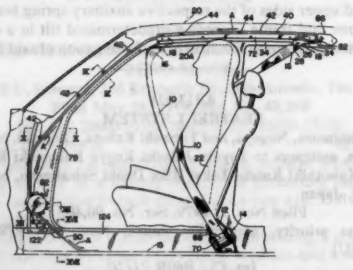
**4,313,622**
**PASSIVE SEATBELT SYSTEM**
**Ichiro Suzuki; Hisashi Ogawa, and Masanao Motonami, all of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan**
**Filed Mar. 6, 1979, Ser. No. 17,941**
**Claims priority, application Japan, Aug. 16, 1978, 53-112183**
**Int. Cl.³ B60R *21/02***
**U.S. Cl. 280—804** **27 Claims**



1. A passive seatbelt system for a vehicle comprising:
a passenger-restraining seatbelt, one end of which is positioned at the center of the vehicle and the other end of which passes across a passenger seat of the vehicle and is disposed at the side of the vehicle;
a flexible non-continuous tape;
a plurality of openings formed along the length of said tape;
a sprocket wheel provided with a multiple number of projections which engage with the openings in said tape, said sprocket wheel comprising the sole element for applying to said tape substantial tensile force and compressive force;
a reversible driving system for driving said sprocket wheel;
means for coupling said tape to a portion of said seatbelt which is remote from said one end thereof, said coupling means enabling said tape to move said portion of said seatbelt selectively towards the front and the rear of the vehicle; and
slide rail means in engagement with said tape for enabling said tape to transmit tensile and compressive forces upon rotation of said sprocket wheel;
whereby driving force of the driving system causes at least said other end end of the passenger-restraining belt to move along the vehicle body to thereby cause said belt to approach or move away from the passenger and be automatically fastened around or removed from said passenger.

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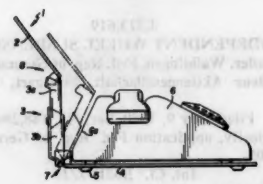
**4,313,623**
**BOOK HOLDER**
**Hans-Gunnar Sundström, Villavägen 254, S-137 00 Västerhaninge, Sweden**
**Filed Dec. 6, 1979, Ser. No. 100,772**
**Claims priority, application Sweden, Dec. 7, 1978, 7812605**
**Int. Cl.³ B42D *17/00, 1/00***
**U.S. Cl. 281—15 B** **17 Claims**

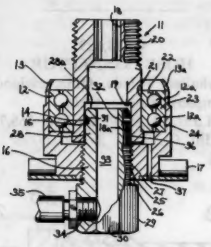


1. A combination register book and holder assembly comprising:
a mounting plate including an edge portion having a tongue-shaped flange projecting outwardly therefrom, said tongue-shaped flange including an end portion extending at an angle to a plane extending parallel to a front surface of said mounting plate;
said mounting plate further including a pair of distinct recesses extending into portions of said mounting plate disposed on opposite sides of said tongue-shaped flange;
a register book including front and back cover portions arranged on opposite sides of said mounting plate, with one of said cover portions including a slit of sufficient size to allow at least a portion of said tongue-shaped flange to project therethrough; and
attachment means for joining said front and back cover portions into a pocket having at least one end of sufficient size to allow for projection of said mounting plate through said pocket until said tongue-shaped flange projects outwardly through said slit and said mounting plate edge portion is disposed adjacent to an interior end surface of said pocket, whereby said tongue-shaped flange provides maximum support for said register book without risking a break in said cover portions.

## 4,313,624
## SWIVEL CARTRIDGE

Frank P. Zierden, Oak Creek, and Peter F. Zierden, Franklin, both of Wis., assignors to Zierden Company, Oak Creek, Wis.

Filed Jun. 6, 1980, Ser. No. 156,937
Int. Cl.³ F16L *27/00*
U.S. Cl. 285—14 6 Claims



1. A swivel cartridge for rotatably coupling a hose to an overhead source of vehicle-washing fluid, the cartridge comprising:

an inlet tube with an entrance end adapted for connection to the fluid source and with a bore therethrough from the entrance end to an exit end;

a bearing secured to the outside of the inlet tube above its exit end and having an outer race that rotates around the inlet tube;

a housing secured to the outer race of the bearing to rotate around the inlet tube, the housing having a bottom positioned below the exit end of the inlet tube and the housing bottom having an opening aligned with the bore of the inlet tube;

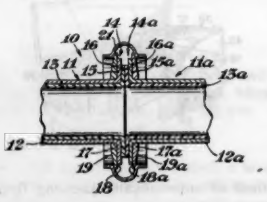
an outlet tube removably mounted in the opening in the housing bottom with a nose that extends upwardly therefrom into the bore of the inlet tube for rotation therein, and with a hose coupling portion that depends from the housing bottom, the outlet tube having a passage therethrough from the bore of the inlet tube to its hose coupling portion, and the nose being smaller in diameter than the bore of the inlet tube to form a clearance; and

a ring seal mounted around the nose of the outlet tube and positioned within the bore of the inlet tube to prevent leakage of vehicle-washing fluid through the clearance, the ring seal being smaller than the opening in the housing bottom, so that it can be removed from the cartridge with the outlet tube without moving the bearing.

## 4,313,625
## LINED PIPE ASSEMBLY

Walter H. West, Essexville, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 43,867, May 29, 1979, abandoned. This application Sep. 26, 1980, Ser. No. 191,181
Int. Cl.³ F16L *9/14, 23/00*
U.S. Cl. 285—55 2 Claims

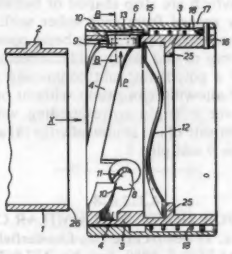


1. An improved pipe joint, the pipe joint comprising a plastic lined conduit having a synthetic resinous pressure deformable liner disposed within a pressure deformable metal conduit, said plastic lined conduit having at least one end, the conduit end defining a radially outwardly projecting flange composed of deformed metal of the metal conduit and deformed plastic of the liner, a loose ring having a generally planar face and a tapering face, the loose ring being disposed about the conduit with the generally planar face of the ring disposed against a metal portion of the outwardly projecting flange, the loose ring having the tapering face remote from the radially outwardly projecting flange, the tapering face tapering outwardly toward a periphery of the flange, a split "V" clamp disposed about the loose ring and an opposed tapering surface of generally like configuration to the tapering face of the loose ring, and the split "V" clamp thereby forcing the deformed plastic of the liner against an opposed liner engaging sealing surface.

## 4,313,626
## COUPLING ARRANGEMENTS

William C. W. Duncan, Bugbrooke, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Feb. 2, 1980, Ser. No. 109,102
Claims priority, application United Kingdom, Jan. 5, 1979, 00329/79
Int. Cl.³ F16L *21/08*
U.S. Cl. 285—86 8 Claims



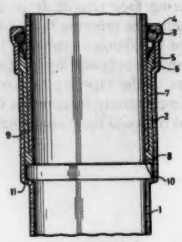
1. A coupling member for a bayonet type coupling arrangement comprising a hollow cylindrical body, said hollow cylindrical body having a plurality of helical tracks formed on its inner surface for slidingly receiving coupling pins projecting from the outer surface of another cylindrical body when said other cylindrical body is inserted into said hollow cylindrical body, said hollow cylindrical body also having a plurality of axially extending tracks formed on its inner surface, each axially extending track intersecting one of said helical tracks, a plurality of locking members mounted in said hollow cylindrical body, one said locking member being positioned at each intersection between a helical track and an axial track, each said locking member having a coupling pin receiving recess and being rotatable between a first angular position in which said recess is aligned with said helical track and a second angular position in which said recess is aligned with said axial track, whereby when said locking members are in said first angular position said coupling pins of said other cylindrical body can only enter said recesses from said helical tracks, and when said locking members are in said second angular position said coupling pins of said other cylindrical body can only be removed from said recesses along said axial tracks, and retaining means for retaining said locking members in said first angular position and for permitting said locking members to rotate to said second angular position.

4,313,627

## PIPE PART WITH A DISPLACEABLE ABUTMENT EDGE

Tinus de Lange, Vroomshoop, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Mar. 29, 1979, Ser. No. 25,198
Claims priority, application Netherlands, Mar. 30, 1978, 7803400
Int. Cl.³ F16L *13/04*
U.S. Cl. 285—114 5 Claims



1. A pipe insert part of thermoplastics for connection of telescopically inserted pipes (9 and 12), said insert being provided with annular means (ring 6) for axially supporting said insert upon pipe 2 and an annular abutment edge for engaging the front side of an inserted pipe (9), said insert being capable of withstanding a maximum axial force executed by axial loads executed upon inserted pipe 9 without breaking, said means (ring 6) and abutment edge 8 being connected by connecting part means (7), which are strip shaped or bar shaped and are circumferentially spaced from each other with the area between adjacent connecting part means being open to the radial interior and exterior of said insert, said connecting part means 7 are formed of a polyolefin, said connecting part means 7 being capable of allowing elongation without breaking when they elongate over a height corresponding with the height between the lower side of the abutment edge (8) and a shoulder (11) between pipe 9 and pipe 1.

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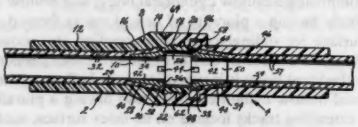
4,313,628

## COUPLING FOR HOSES AND SIMILAR CONDUITS

Milton J. Duenke, 17 Jennycliffe La., Chesterfield, Mo. 63017

Filed May 8, 1980, Ser. No. 147,565
Int. Cl.³ F16L *33/24*
U.S. Cl. 285—115 11 Claims



1. In combination with first and second conduits, such as hoses, a connection for joining the conduits at their ends, said connection comprising: a first flexible body fitted over the first conduit, the first flexible body being formed from a plastics and having at one end a threaded section provided with external threads; a first bushing fitted into the end of the first conduit such that the first conduit is spread outwardly and bears against the first flexible body, forming a fluid-tight seal therewith, the first bushing being made from a material that is substantially harder and less flexible than the material from which the first flexible body is formed; a second flexible body fitted over the second conduit and also being formed from a plastics; a second bushing fitted into the end of the second conduit such that the second conduit is spread outwardly and bears against the second flexible body, forming a fluid-tight seal therewith, the second bushing being made from a material that is substantially harder and less flexible than the material from which the second flexible body is formed; and a ring engaged with the second flexible body such that it can rotate on the second flexible body but is confined axially on that body, the ring having internal threads for engaging the external threads on the threaded section of the first flexible body and drawing the two flexible bodies into abutting engagement with one another and fluid-tight contact.

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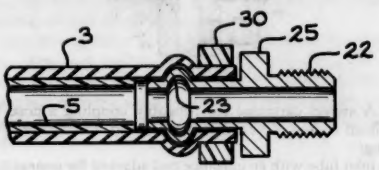
4,313,629

## HOSE CONNECTOR

Melvin J. Winterhalter, Toledo, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Jul. 14, 1980, Ser. No. 168,749
Int. Cl.³ F16L *33/02, 33/20*
U.S. Cl. 285—242 20 Claims




1. Connector apparatus comprising:

a hose having a resilient core with a resilient cover over said core, a passageway being defined in the center of said core, said core having an annular region of reduced thickness at one end of said hose, said region of reduced thickness producing an increased inside diameter in said passageway at said end of hose;

a connector engagably positioned in said passageway in said hose at said end where said core has a region of reduced thickness, said connector having an annular enlarged diameter portion, said enlarged diameter portion having a diameter larger than the inside diameter of said region of reduced thickness in said hose; and

clamping means positioned on the exterior of said hose at the end where said connector is positioned in said hose, said clamping means sealingly securing said connector in said region of reduced thickness of said hose.

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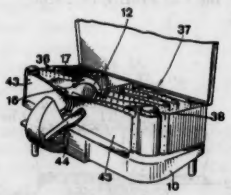
4,313,630

## METHOD AND APPARATUS FOR KNOTTING AUTOMATICALLY MOUTHS OF FLEXIBLE PACKAGINGS

Angel L. Barroso, Ronda Carlos III, s.n., Martaro (Barcelona), Spain

Filed Oct. 24, 1979, Ser. No. 87,792
Claims priority, application Spain, Oct. 31, 1978, 475.086
Int. Cl.³ B65H *69/04;* A01D *59/04*
U.S. Cl. 289—1.5 14 Claims




1. A method of automatically knotting flexible packages comprising:

entering a string on a support in the form of a plurality of adjacent closed loops, each with its ends crossed;

placing the area of the package to be knotted across one of the loops;
tightly grasping said one loop at the loop segment directly across from and farthest from the crossed ends of the one loop;
moving said loop segment in an arc about said package so that the path of the said segment encircles said area to be knotted of the package;
inserting said loop segment through the one loop itself;
pulling said loop segment until the string becomes tightly knotted around the rear to be knotted; and
cutting said ends of said loop.

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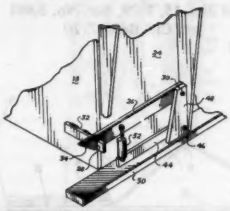
**4,313,631**

## LATCH FOR MODULE BUILDER

**Don R. Johnson, Lubbock, Tex., assignor to Harris & Thrush Manufacturing Company, Wolfforth, Tex.**

**Filed Dec. 3, 1979, Ser. No. 99,882**
**Int. Cl.³ E05C *3/30***
**U.S. Cl. 292—201** **2 Claims**



1. In a cotton module builder having
a. a frame,
b. a door hinged at its top to the frame,
c. a knotched latch bar pivoted to the frame,
d. a plate attached to the door to cooperate with the latch bar to hold the door closed,
e. cam means on the latch bar for raising the latch bar as it moves into engagement with the plate,
f. a source of hydraulic fluid under pressure,
g. a hydraulic door cylinder interconnecting the frame and door to open the door, and
h. hydraulic lines between the source and door cylinder; wherein the improvement comprises;
j. a hydraulic latch cylinder having one end connected to the latch bar and the other end connected to a floating bar,
k. said floating bar pivoted to the frame so that the floating bar and latch bar may be in parallel positions,
m. the floating bar
(i) limited in its downward travel, and
(ii) below the latch bar,
n. the latch cylinder fluidly connected to the hydraulic lines,
o. so that pressure on the hydraulic lines to open the door also opens the latch bar by means of the latch cylinder, and
p. pressure on the hydraulic lines to close the door also closes the latch bar through the latch cylinder.

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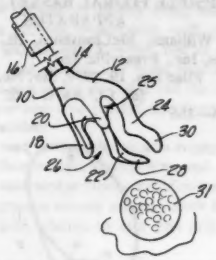
**4,313,632**

## GOLF BALL RETRIEVER

**Gilbert T. King, deceased, late of Utica, Mich., and Gilbert D. King, administrator, 45810 Cass Ave., Utica, Mich. 48087**

**Filed Jan. 17, 1980, Ser. No. 112,875**
**Int. Cl.³ A63B *47/02***
**U.S. Cl. 294—19 A** **9 Claims**

1. A golf ball retriever comprising a shaft, a body made in one piece of substantially rigid elastically deformable material having a top portion including a shaft retaining means, a pair of posterior fingers and a pair of anterior fingers depending in spaced relationship from the top portion to form a pocket having a concave inner surface, said fingers terminating in spaced relationship defining an opening slightly smaller in diameter than a golf ball, a prong extending substantially horizonally from the lower portion of each anterior finger and away from said shaft defining a scoop means having a width



smaller than the diameter of a golf ball, whereby a golf ball may be retained temporarily for transportation by being either forced through the opening and gripped in the pocket defined by the anterior and posterior fingers, or lodged between the prongs.

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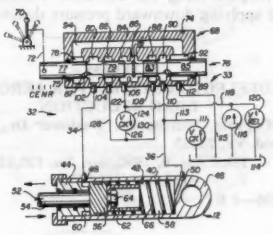
**4,313,633**

## SELF ADJUSTING ACTUATOR SYSTEM

**John R. Muntjanoff, Aurora, and Charles E. Lanchantin, Jr., Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**

**Filed Jul. 11, 1979, Ser. No. 94,256**
**Int. Cl.³ B66C *3/16*; F15B *13/042***
**U.S. Cl. 294—88** **14 Claims**



1. A self adjusting actuator system (32/32') comprising:
a fluid reservoir (114);
an actuator (12) having a housing (40), a telescoping piston (52) located within the housing (40) and defining first and second chambers (58,60) and urging means (66) for biasing the piston (52) in a preselected direction against an external force;
control means (33/33') for selectively supplying pressurized fluid to either of the chambers (58,60), the control means (33/33') including control valve means (68/68'), the control valve means (68/68') further including a control spool (76/76') having first and second operating positions corresponding to extending and retracting the actuator (12), and a third operating position, said control valve means (68/68') having valve means (34,102,80,75,78/34,123,121) for egress of fluid from the second chamber (60) in the third operating position of the control spool (76/76') in response to a change in the external force and movement of the piston (52) by the urging means (66), said control spool (76/76') obstructing pressurized fluid flow to said chambers (58,60) in said third operating position; and
means (111,113,36) for ingress of make-up fluid from said reservoir (114) into the first chamber (58) in the third operating position of the control spool (76/76') in re-

sponse to movement of the piston (52) effected by said urging means responsive to a change in said external force.

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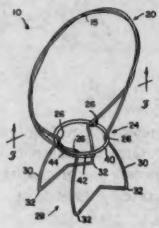
4,313,634
COLLAPSIBLE FLORAL BASKET, METHOD AND APPARATUS
Stanley E. Williams, McLeansboro, Ill., assignor to George Koch Sons, Inc., Evansville, Ind.
Filed Sep. 19, 1979, Ser. No. 77,126
Int. Cl.³ A47G 7/02
U.S. Cl. 294—166 14 Claims



1. An apparatus for supporting a container comprising a collapsible frame and means for retaining the container which in cooperation with the frame renders the apparatus self-supportive, the frame including an expandable base portion and a handle portion, the retaining means being expandable and encompassing the frame intermediate the base portion and the handle portion to lock the apparatus in a supportive position in response to positioning the container within the retaining means and applying downward pressure thereto.

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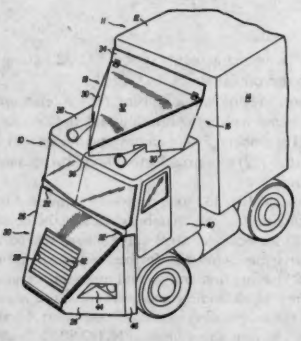
4,313,635
WIND DEFLECTOR SYSTEM FOR AERODYNAMIC DRAG REDUCTION
Charles M. Front, Matchpoint, Westower Dr., Apt. 5840 D, Richmond, Va. 23225
Filed Apr. 8, 1980, Ser. No. 138,626
Int. Cl.³ B60J 9/04
U.S. Cl. 296—1 S 9 Claims



1. A wind deflector system for a flat-nosed vehicle of the type having a cabin over the engine which comprises
a. a first wind deflector stage attachable to the front of the vehicle,
1. said first wind deflector stage being generally wedge-shaped in side elevation with a first, centrally located surface for deflecting wind upwardly toward the top of the cabin,
2. said first wind deflector stage having a pair of side deflecting surfaces for deflecting the wind around the sides of the cabin,
3. said first wind deflector stage being pivotally attached to said vehicle adjacent the top of said first, centrally located wind deflecting surface and releasably connected to said vehicle adjacent the bottom of said wedge-shaped deflector whereby said first wind deflector stage may be pivotally advanced with respect to the front of said vehicle so as not to restrict the full forward tilting of said cabin when it is desired to gain access to the engine of said vehicle,
b. a second wind deflector stage mounted atop the cabin,
1. said second wind deflector stage having first surface means for deflecting wind over the top of a trailer following said vehicle,
2. and second surface means for deflecting wind around the sides of said trailer.

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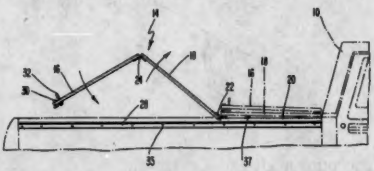
4,313,636
FOLDING COVER FOR TRUCK BED
Larry B. Deeds, Rte. 1, Box 216, Rochelle, Tex. 76872
Filed Jan. 15, 1979, Ser. No. 3,493
Int. Cl.³ B60J 7/10
U.S. Cl. 296—100 13 Claims



1. A cover for the bed of a pickup truck, the cover comprising a plurality of horizontal, rigid panel sections; means for supporting said panel sections above a load bearing surface of said bed; at least one of said panel sections being fixedly attached in stationary position on said supporting means above the load bearing surface, said fixed panel section restraining said plurality of panel sections against sliding thereof on said supporting means in a manner to reduce noise and minimize vibration and wear of the cover; transverse hinge means for interconnecting adjacent ones of said panel sections and enabling pivoting of sections about said fixed panel section or sections along axes perpendicular to side walls of said bed between closed horizontal positions and open positions, and being further operable to prevent sliding movement of said panels and means for releasably locking closed at least one of said pivotable panel sections.

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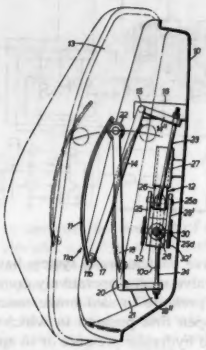
4,313,637
SEAT HAVING A MOVABLE LUMBAR SUPPORT
Geoffrey W. Barley, Kislingbury, England, assignor to UOP Inc., Des Plaines, Ill.
Filed Nov. 13, 1979, Ser. No. 93,567
Claims priority, application United Kingdom, Nov. 18, 1978, 45172/78
Int. Cl.³ A47C 7/46
U.S. Cl. 297—284 4 Claims

1. A seat having a back rest which comprises a back rest frame, a lumbar support member, and a support mechanism mounting said lumbar support member on said frame, said lumbar support member having a support surface which is arcuate about a horizontal axis transverse to the back rest, the support mechanism being operable in one mode to displace the lumbar support in a forward or rearward direction and in a second mode comprising two upwardly-extending horizontally-spaced pairs of support arms, means defining first pivotal connections at one end of said arms to the back rest frame and

means defining second pivotal connections at the opposite end of said arms to the lumbar support member, the support arms of each pair being relatively movable to displace the second pivotal connections to effect a rolling or tilting action of the lumbar support member about a horizontal axis, and wherein said mechanism comprises means interconnecting one support arm of each pair to form a first lever, the first pivotal connections of said arms being located on said first lever at a level adjacent to or above the top of the lumbar support member and the second pivotal connections of said arms being located on said first lever at a level adjacent the bottom of the lumbar support member, and means interconnecting the other support arm of each pair to form a second lever, the first pivotal con-



nections of said other arms being located on said second lever at a level adjacent to or below the bottom of the lumbar support member and the second pivotal connections of said other arms being located on said second lever at a position adjacent the top of the lumbar support member, one of said connections being a sliding or rolling connection, said mechanism including means for rotating said levers in opposite senses about the axes of their first pivotal connections in order to move the member forwardly and rearwardly and for rotating said levers in common senses about said axes in order to effect said rolling or tilting action on the member, and simultaneously to move said axis vertically, to raise or lower the level at which the lumbar support member supports the back of a seat occupant.

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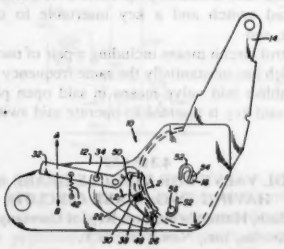
**4,313,638**

## INFINITELY VARIABLE SEAT RECLINER MECHANISM

**Daniel W. Roper, Rochester, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.**

**Filed Jul. 30, 1980, Ser. No. 173,488**
**Int. Cl.³ A47C *1/027***
**U.S. Cl. 297—374** **12 Claims**



1. An infinitely adjustable hinge comprising:
a first arm having a camming surface thereon; a second arm;
a pivot pin extending through and retained between said first and said second arm;
two wedge blocks having a generally V-shaped friction surface at one end thereof slidably mounted and retained on said camming surface of said first arm;
a friction surface on said second arm, having a cross section capable of mating with said friction surface on said wedge block;
said wedge blocks capable of sliding along said camming surface and into locking engagement with said friction surface on said second arm whereby one of said wedge blocks prevents said second arm from rotating with respect to said first arm in one direction and the other of said wedge blocks prevents said second arm from rotating in the opposite direction;
means for biasing said wedge blocks into engagement with said friction surface on said second arm; and
means for moving said wedge blocks out of contact with said friction surface on said second arm to permit free rotation of said second arm relative to said first arm about said pivot pin.

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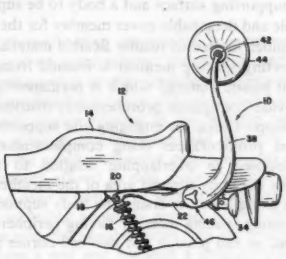
**4,313,639**

## MOTORCYCLE BACKREST

**Robert A. Ware, Tulsa, Okla., assignor to Ware Manufacturing, Incorporated, Tulsa, Okla.**

**Filed May 29, 1979, Ser. No. 43,110**
**Int. Cl.³ A47C *1/025*; B62J *1/00***
**U.S. Cl. 297—366** **17 Claims**



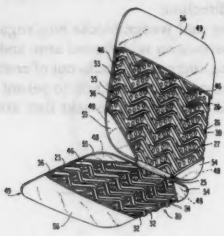
1. A motorcycle backrest for mounting to the frame and working in cooperation with a two-place seat of a motorcycle, the backrest comprising
a pair of oppositely disposed substantially horizontal frame arms, the forward end of said frame arms being securable to the motorcycle frame, rear bracket members for securing the rear ends of said frame arms to the motorcycle frame below the seat and on either side thereof;
a pair of oppositely disposed elongated support arms, a backrest pad member having a backrest surface and being directly secured to and disposed adjacent to first ends of the support arms; and
means for pivotally securing opposite second ends of the support arms to the frame arms on either side of a rearmost portion of the two-place motorcycle seat, said means including means for selectively locking the support arms at a desired angular position ranging from substantially vertical for providing upper back support for a rearmost rider to a forward position for positioning said backrest member near the mid portion of the motorcycle seat to provide lower back support for a motorcycle driver alone;
wherein said backrest pad member is configured such that said backrest surface is presented in a same forwardly facing orientation relative to the back of the user regardless of the angular position of the support arms.

4,313,640

## COVERED BODY SUPPORTING AND SPACING STRUCTURE AND REMOVABLE COVER THEREFOR

Helen H. Trotman, and Herbert H. Trotman, both of P.O. Box 807, Virginia Beach, Va. 23451

Filed May 13, 1980, Ser. No. 149,306
Int. Cl.³ A47C 7/02
U.S. Cl. 297—453 6 Claims



1. The combination of a supporting spacing member for use between a supporting surface and a body to be supported and an attachable and detachable cover member for the supporting spacing member formed of readily flexible material, wherein

the supporting spacing member is formed from a sheet of resilient plastic material which is permanently deformed to provide contiguous protuberances distributed over a body support area for engaging the supporting surface, adjacent protuberances being complementary in shape and disposed in overlapping relation to each other whereby the body support area of the member will resist flexing along lines traversing the body support area,

the supporting spacing member having peripheral marginal portions, an end portion and two end corner portions,

the cover member comprising

a front panel for surface contact with the body to be supported corresponding generally in shape to the supporting spacing member and having peripheral marginal portions, an end portion and two end corner portions coinciding with peripheral marginal portions, the end portion and two end corner portions respectively of the supporting spacing member,

a rear panel having peripheral marginal portions connected along one end marginal portion thereof to one end marginal portion and to opposite side marginal portions of the front panel to form a pocket receiving in snug fitting relation one end portion of the supporting spacing member, and

a pair of spaced rear corner panels each having a peripheral marginal portion, each corner panel being connected along a marginal portion to a different end corner portion of the front panel to form two separate corner pockets, each corner pocket being dimensioned to receive in snug fitting relation a different end corner of a supporting spacing member,

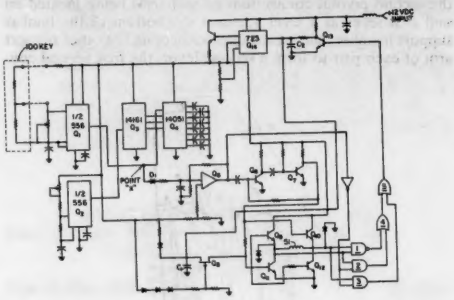
the protuberances on the supporting spacing member coacting with one another to stiffen the supporting spacing member against excessive deflection in use as a supporting spacing member while accommodating limited flexure of the supporting spacing member during application and removal of the cover member.

4,313,641

## SELECTIVELY OPERABLE CONTROL SYSTEM FOR VEHICLE BRAKE VALVE

Stanley S. Wise, Palm Beach, and Gregory Csurgay, Fort Lauderdale, both of Fla., assignors to Fail Safe Industries, Inc., Lantana, Fla.

Filed Nov. 2, 1979, Ser. No. 90,760
Int. Cl.³ B60T 13/68
U.S. Cl. 303—3 5 Claims




5. In an automotive vehicle brake system having hydraulic brake means, and valve means operatively connected to control the hydraulic pressure in said brake means, said valve means having an open first position in which it is operable either to relieve said hydraulic pressure or to apply a pressure increase to said brake means, said valve means having at least one additional position in which it acts as a one-way check valve operable to apply a pressure increase to said brake means but not to relieve pressure in said brake means, the improvement which comprises:

an electrically energizable means for controlling the position of said valve means;

and a control circuit means operatively connected to said electrically energizable means which affects the positioning of said valve means in said open position when the vehicle is moving and in said additional position after the vehicle stops;

said control circuit means including;

a selectively operable device;

and a means for energizing said electrically energizable means with current to position said valve means in said additional position when said selectively operable device is not operated and for energizing said electrically energizable means with current to position said valve means in said open position when said selectively operable device is operated; said selectively operable device including a key operated switch and a key insertable to operate said switch; and

said control circuit means including a pair of oscillators, one of which has substantially the same frequency as the other to establish said valve means in said open position only when said key is inserted to operate said switch.

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4,313,642

## CONTROL VALVE FOR VEHICLE BRAKE SYSTEMS HAVING TWO BRAKE CIRCUITS

Volker Berisch, Hattersheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

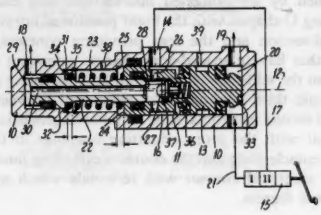
Filed Jun. 2, 1980, Ser. No. 155,828
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1979, 2926539
Int. Cl.³ B60T 8/02, 8/26
U.S. Cl. 303—6 C 16 Claims

1. A control valve for vehicle brake systems having two brake circuits to control the application of full operating pres-

sure to a first of said two brake circuits when pressure drops in a second of said two brake circuits comprising:

a pressure reducing valve disposed in a pressure medium connection from a master cylinder to said first of said two brake circuits to effect said control, said reducing valve including

a pressure sensing piston disposed in a housing bore coaxial of a longitudinal axis of said housing bore movable in a first direction, said sensing piston having a first active surface exposed to uncontrolled pressure of said first of said two brake circuits and a second active surface ex-



posed to uncontrolled pressure of said second of said two brake circuits, said first active surface being smaller than said second active surface,

a stepped piston having at least one large diameter portion and at least one smaller diameter portion disposed in said housing bore coaxial to said axis movable in a direction opposite said first direction, an end portion of said smaller diameter portion being slidably sealed in a first bore in the adjacent end portion of said sensing piston, and

a spring disposed about said smaller diameter portion acting on said sensing piston and said stepped piston.

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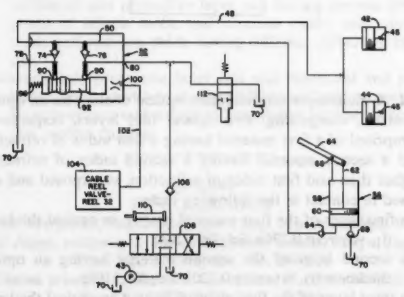
**4,313,643**

## EMERGENCY BRAKE SYSTEM EMPLOYING SHUTTLE VALVE

**Vern R. Exley, Conneaut Lake, Pa., assignor to Joy Manufacturing Company, Pittsburgh, Pa.**

**Filed Jan. 18, 1980, Ser. No. 113,011**
**Int. Cl.³ B60T *13/22***
**U.S. Cl. 303—71** **7 Claims**



1. An emergency vehicle brake system comprising brake means, spring means for actuating the brake means to brake the vehicle, means including a power-operated pump on said vehicle for pressurizing said brake means to release the same against the force of said spring means when power is supplied to the vehicle, auxiliary pump means on said vehicle for pressurizing said brake means to release the same when power is not supplied to the vehicle, and shuttle valve means for connecting said power-operated pump to the brake means when power is supplied to the vehicle, said shuttle valve means being actuable when power is initially supplied to the vehicle to release pressure applied to the brake means by the auxiliary pump means before pressure is applied to the brake means by the power-operated pump, said shuttle valve means includes a pair of check valves which can be opened to permit flow in either direction by cam followers riding on the surface of a hydraulically-actuated spool, one of said valves when open connecting said brake means to a hydraulic reservoir, the other of said valves when open being adapted to connect the brake means to said power-operated pump.

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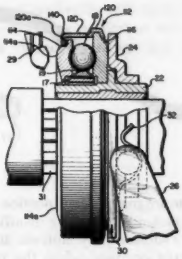
**4,313,644**

## THRUST BEARING ASSEMBLY

**Richard T. Dagiel, Elkgrove Village, Ill., assignor to Aetna Bearing Company, Chicago, Ill.**

**Filed Jan. 3, 1980, Ser. No. 109,223**
**Int. Cl.³ F16C *19/10, 33/76***
**U.S. Cl. 308—233** **5 Claims**



4. A thrust bearing comprising in combination: first and second spaced apart annular thrust rings and a plurality of bearing elements rotatably retained therebetween, and annular retaining means for holding said spaced apart thrust rings in a fixed axial spaced relation to one another while permitting relative rotation therebetween and about a common axis, wherein the annular retaining means includes a shell member non-rotatably affixed to said second annular thrust ring and extended over a portion of said first annular thrust ring and further including generally annular sealing means interposed between said first annular thrust ring and said shell member so as to form a seal and maintain a close tolerance fit therebetween while still permitting substantially unimpeded relative rotation therebetween, said annular sealing member being nonrotatably affixed to said first annular thrust ring and presenting a minimal surface to said shell member so as not to inhibit substantially relative rotation therebetween.

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**4,313,645**

## TELEPHONE CORD HAVING BRAIDED OUTER JACKET

**Eugene R. Cocco, Baltimore, Md., assignor to Western Electric Company, Inc., New York, N.Y.**

**Filed May 13, 1980, Ser. No. 149,597**
**Int. Cl.³ H01B *7/06***
**U.S. Cl. 339—103 M** **6 Claims**

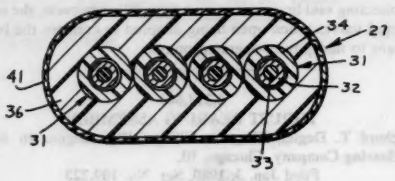
1. A length of retractile telephone cordage which is coiled in and heat-set in a helical configuration, said cordage comprising:

a plurality of conductors, each of said conductors being insulated with a thermoplastic material which is capable of being coiled in a helical configuration and of being heat-set in such configuration;

an inner jacket which is made of a plastic material and which encloses said plurality of individually insulated conductors; and

a braided outer jacket which encloses and which is in engagement with said plastic inner jacket, said braided outer

jacket including a coating which impregnates an end portion of the braid and bonds said end portion to said plastic inner jacket, said engagement of said braided outer jacket with said plastic inner jacket being sufficient to



cause said impregnated end portion to adhere to said plastic inner jacket while being insufficient to prevent the inhibition of a substantially uniform distribution of helices of the retractile cordage when the retractile cordage is extended.

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**4,313,646**

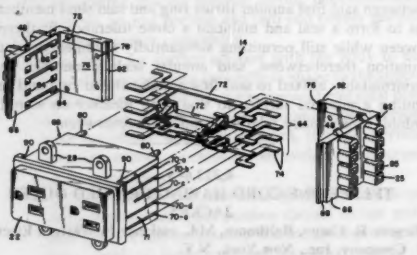
**POWER DISTRIBUTION SYSTEM**

**Wayne L. Millhimes, Hershey, and Wilmer L. Sheesley, Dauphin, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.**

**Filed Feb. 25, 1980, Ser. No. 124,363**

**Int. Cl.³ H01R *13/00***

**U.S. Cl. 339—156 R** **5 Claims**



1. A power box assembly useful in an electrical distribution system in modular wall panels, the power box comprising:

a. a rectangular housing of insulating material adapted to be mounted in a modular wall panel and having a duplex receptacle plate with blade-admitting slots and prong-admitting openings on the front face, and first, second and third horizontal slots extending into the housing from the back face with the slots and openings of the duplex receptacle plate intersecting the horizontal slots;

b. a plurality of laterally extending shells arranged in two vertical rows on each side of the housing and having openings which are in alignment with the horizontal slots in the housing, said shells each adapted to receive therein an electrical terminal.

c. first and second buss bars each having contact-carrying end sections joined by an elongated mid-section with spaced-apart, blade-receiving receptacles on the mid-section, said end sections being U-shaped with the bight positioned normally to the mid-section and the legs providing contacts, said first and second bars being positioned in the first and second horizontal slots in the housing with the receptacles being in alignment with the blade-admitting slots in the duplex receptacle plate, and the contacts extending into the shells for electrical contact with terminals which may be inserted therein; and

d. a third buss bar having contact-carrying end sections joined by an elongated mid-section, said end sections being U-shaped with the bight positioned normally to the mid-section and the legs providing contacts, said bar further having spaced-apart fingers extending forwardly from the mid-section, said third buss bar being positioned in said third horizontal slot positioned between the first and second horizontal slots with the fingers being in alignment with the prong-admitting openings in the duplex receptacle plate and the contacts extending into the shells for electrical contact with terminals which may be inserted therein.

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**4,313,647**

**NONREFLECTIVE COATING**

**Eiichi Takazawa, Kokubunji, Japan, assignor to Mamiya Koki Kabushiki Kaisha, Japan**

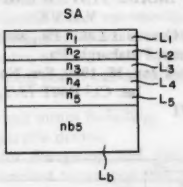
**Continuation of Ser. No. 752,000, Dec. 17, 1976, abandoned.**

**This application Jan. 2, 1980, Ser. No. 109,063**

**Claims priority, application Japan, Dec. 23, 1975, 50-153603; Dec. 23, 1975, 50-153604**

**Int. Cl.³ G02B *1/10***

**U.S. Cl. 350—164** **2 Claims**




1. A multi-layer nonreflective optical coating on an optical substrate, comprising: five optical film layers, respectively comprised of a first material having a first index of refraction and a second material having a second index of refraction higher than said first index of refraction, superposed and disposed in contact in the following order;

a first layer of the first material having an optical thickness $d_1$, wherein $0.270\lambda \leqq d_1 \leqq 0.320\lambda$;

a second layer of the second material having an optical thickness $d_2$, wherein $0.120\lambda \leqq d_2 \leqq 0.210\lambda$;

a third layer of the first material having an optical thickness of $d_3$, wherein $0.042\lambda \leqq d_3 \leqq 0.125\lambda$;

a fourth layer of the second material having an optical thickness $d_4$, wherein $0.111\lambda \leqq d_4 \leqq 0.214\lambda$, wherein said second and fourth layers have substantially the same optical thickness;

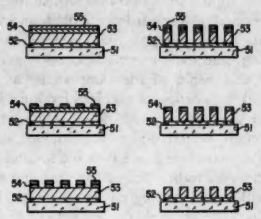
a fifth layer of the first material having an optical thickness $d_5$, wherein $0.010\lambda \leqq d_5 \leqq 0.065\lambda$;

and an optical substrate having an index of refraction of from 1.65 to 1.90 at light wavelength $\lambda$, and having said five contacting superposed optical film layers disposed thereon with said fifth layer contacting said substrate.

## 4,313,648
## PATTERNED MULTI-LAYER STRUCTURE AND MANUFACTURING METHOD

**Kensaku Yano, Yokohama, and Kenji Takahashi, Sagamihara, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Apr. 27, 1978, Ser. No. 900,650**
**Claims priority, application Japan, Apr. 30, 1977, 52-49089**
**Int. Cl.³ G02B *5/28***
**U.S. Cl. 350—166** **11 Claims**



1. A manufacturing method for a patterned multi-layer article comprising the steps of:

forming on a substrate a protective layer comprising at least one refractory material selected from the group consisting of aluminum oxide, zirconium oxide, cerium oxide, cerium fluoride, thorium oxide, praseodymium chloride, praseodymium oxide, lanthanum oxide and lanthanum fluoride, which is resistant to reactive sputter etching;

forming on the protective layer a laminated layer having laminae composed of silicon oxide and titanium oxide, said silicon oxide and titanium oxide being etched at different rates by reactive sputter etching; and

etching the laminated layer by reactive sputter etching to form a predetermined pattern.

7. A patterned optical multi-layer article comprising:

a substrate;

a protective layer comprising at least one refractory material selected from the group consisting of aluminum oxide, zirconium oxide, cerium oxide, cerium fluoride, thorium oxide, praseodymium chloride, praseodymium oxide, lanthanum oxide and lanthanum fluoride formed on the surface of the substrate; and

at least one laminated and patterned layer formed on the surface of said protective layer and having laminae composed of silicon oxide and titanium oxide, said silicon oxide and titanium oxide having different refractive indices,

wherein said protective layer and said laminated and patterned layer constitute an optical filter, and said protective layer prevents said substrate from being etched by reactive sputter etching.

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## 4,313,649
## LENS ASSEMBLY

**Teruo Morikawa, Sagamihara, and Shinji Murata, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

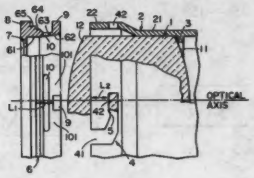
**Filed Jan. 3, 1980, Ser. No. 109,276**
**Claims priority, application Japan, Jan. 17, 1979, 54-4461**
**Int. Cl.³ G02B *7/02*; F16L *47/06***
**U.S. Cl. 350—252** **8 Claims**

1. A lens assembly comprising:

a lens;

a cylindrical lens tube member for accommodating said lens, said tube member having a positioning surface for bearing against and positioning one end of said lens; and

a fastening member, engageable with said tube member, for bearing against the other end of said lens, one of said tube and fastening members having a slot which extends at least in part in a direction transverse to the optical axis of said lens, and the other member having a corresponding projection engageable with said slot, one of said members having a resiliently deformable portion, wherein when said projection is in engagement with said slot the distance from a predetermined reference to the portion of said projection which engages said slot, and the distance from




the predetermined reference to the portion of the inside surface of the slot are so related that said resiliently deformable portion is resiliently deformed to resiliently urge said projection toward a portion of the inside surface of said slot which extends in a direction transverse to the optical axis.

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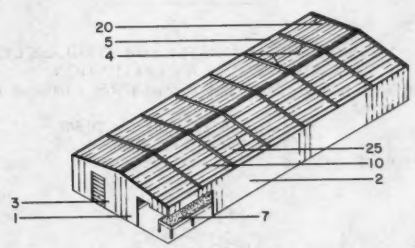
## 4,313,650
## APPARATUS FOR CONTROLLING LIGHT AND HEAT TRANSFERENCE FOR GREENHOUSES

**Jack D. Ward, and Douglas G. Ward, both of Garden Valley, Id. 83622**

**Filed Jun. 27, 1980, Ser. No. 163,810**
**Int. Cl.³ G02B *27/00***
**U.S. Cl. 350—263** **6 Claims**




1. Apparatus for controlling light and heat transference to and from a greenhouse comprising:

a plurality of slat sets suspendable from a greenhouse roof in an inclined position and in parallel relationship with one another to define an internal roof-like structure, each of said slat sets including a plurality of self-supporting slats placed in parallel with one another, each slat adapted to overlap an adjacent and lower placed slat, and each slat including a main body portion of bulk insulation of low thermal conductivity and an outer covering of reflective insulation having low emissivity of thermal radiation;

means for the holding and simultaneous tilting the slats of each set about their longitudinal axis for opening and closing said slats; and

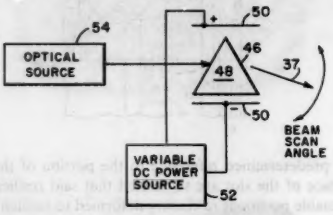
means for suspending said slat sets from the roof of a greenhouse.

4,313,651

## OPTICAL BEAM SCANNER

Walter E. Miller, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 22, 1979, Ser. No. 13,947
Int. Cl.[3] G02F 1/01
U.S. Cl. 350—355 10 Claims




1. A method for providing a scanned optical beam of light comprising the steps of:

directing a beam of light to be scanned along a fixed path into an optical medium having a variable index of refraction;

applying an electric field to at least one pair of parallel capacitive plates and across said medium for changing the refractive index;

varying said electric field applied across said medium so that an electric field gradient is developed at edges of said parallel pairs of capacitive plates said beam of light being directed between corresponding pairs of said capacitive plates and along the edges of said plates within the region of said gradient for causing the refractive index to change as said field varies, thereby scanning said beam; developing a variable voltage between said capacitive plates for applying said variable electric field across said medium; and varying the refractive index of said optical medium using the inverse Stark effect, for providing beam scanning through a scan angle while maintaining said optical medium fixed with respect to the light beam.

4,313,652

## METHOD AND APPARATUS FOR EYEGLASS LENS ADJUSTMENT AND RETENTION

Marvin Berman, 24955 Bob Batchelor Rd., Calabasas, Calif. 91302

Filed Aug. 29, 1979, Ser. No. 70,562
Int. Cl.[3] G03B 41/02, 41/06
U.S. Cl. 351—106 18 Claims

1. In a pair of eyeglasses, having a frame with a right eye portion and a left eye portion, in which the lateral position of each of a pair of lenses on the frame is crucial to proper vision of a wearer of the glasses, the improvement in the apparatus for mounting each lens and adjusting each lens to the proper lateral location for a specific wearer comprising:

a first lens supporting member fixedly attached to the respective one of the right and left eye portions, said first lens supporting member having a first grooved section;

a second lens supporting member having a second grooved section, said first and second grooved sections defining a locking cavity between said first lens supporting member and said second lens supporting member when said first lens supporting member and said second lens supporting member are tightly bound together, said locking cavity being closed except for a lens receiving opening when said lens supporting members are bound together;

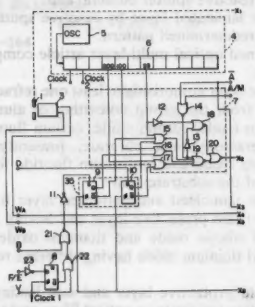
a plurality of binding elements extending through at least one of said first lens supporting member and said second lens supporting member and adapted to be tightened and loosened to tightly bind said first lens supporting member to said second lens supporting member; and a lens, having a top portion, and having a male grooved portion on said top portion, said male grooved portion having a straight top edge and being of the same shape as said locking cavity, said top portion of said lens having a length which is less than the length of said closed cavity, and adapted to be frictionally bound within said locking cavity against lateral movement when said first and second lens supporting members are tightly bound together and to be laterally moved within said locking cavity when said lens supporting members are loosened for adjustment of said lens with respect to said supporting member.

4,313,653

## CONTROLLER FOR LAPPING PHOTOGRAPHY OF CINECAMERA

Kuniharu Takeda, Chino, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Sep. 12, 1979, Ser. No. 74,697
Claims priority, application Japan, Sep. 13, 1978, 53-112810
Int. Cl.[3] G03B 21/36
U.S. Cl. 352—91 C 4 Claims




1. A controller for the lapping photography of a cinecamera, comprising: means for changing the detected level of the quantity of light of an EE (electric eye) mechanism in response to lap signals; means for stopping down a diaphragm to the detected level of the quantity of light, at which a prime mover is interchanged at a constant speed; means for interrupting the feed of film at a preset feed and for rewinding the film a preset feed after the diaphragm is stopped down to its full stroke; means made operative, after the operations of the stop-down means and the interrupting means, to stop down the diaphragm to its full stroke at a high speed; and means for opening the diaphragm after the film rewinding operation to the detected level of the changed quantity of light at a high speed, a diaphragm control mechanism adapted to be controlled by a stepping motor; light receiving detector means for detecting the quantity of light having passed through said diaphragm control mechanism; an oscillatory circuit for generating a plurality of repeated pulse trains having different frequencies to turn said stepping motor at different speeds; a gate circuit for selecting one of the plural pulse trains generated by said

oscillatory circuit; a gate control circuit for generating frequency selecting signals in said gate circuit in response to the control signals, which are generated in accordance with the progress of the operating mode such as lap or fade photography, and for holding the signals having the selected frequency, even if said control signals are varied when they are to restore their initial condition, until said detector means generates the signals indicative of the fact that the preset exposure level is reached; and a motor control circuit for driving said stepping motor in response to the output of said gate control circuit.

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**4,313,654**

## AUTOMATIC RANGEFINDER SYSTEM FOR PHOTOGRAPHIC CAMERA WITH LIGHT EMITTING AND RECEIVING MEANS

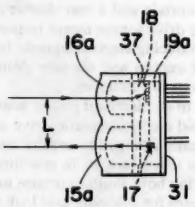
**Toru Matsui, Osaka; Motonobu Matsuda, Kawachinagano; Hiroshi Ueda, Nara; Yasuhiro Nanba, Osaka, and Yoshio Kuramoto, Toyonaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Higashi, Japan**

**Filed Sep. 6, 1978, Ser. No. 940,135**

**Claims priority, application Japan, Sep. 6, 1977, 52-107533; Sep. 6, 1977, 52-107534**

**Int. Cl.³ G03B *3/00***

**U.S. Cl. 354—25** **14 Claims**




1. A rangefinder of the zone-monitoring type for a photographic camera, the rangefinder comprising a light emitter means for emitting and projecting a beam of light for illuminating a target object located within one of a plurality of zones at different distances away from the rangefinder, a first convergent lens positioned for receiving and converging the beam of light projected by the light emitter means, a light receiver positioned in a predetermined position offset laterally from the light emitter means relative to the direction in which the light is projected through said first convergent lens, said light receiver including a plurality of photoresponsive elements for detecting the image of the beam of light reflected from the target object, each of said photoresponsive elements being positioned to receive the image reflected from a target object in a corresponding zone, each of said photoresponsive elements having a parameter the magnitude of which varies as a function of the intensity of the light incident thereon, a second convergent lens for receiving light from a target object and forming an image of the area of the target object, illuminated by the projected beam of light on one of the photoresponsive elements corresponding to the zone where the object is located, means coupled to the light receiver and responsive to changes in the magnitude of the parameter of the illuminated photoresponsive elements for providing a signal representative of the zone which the target object actually occupies, and a plate member on which said light emitter means and said light receiver are rigidly mounted.

**4,313,655**

## FOCUSSING SYSTEM WITH AUTOMATIC CONTROL OF EMITTED RADIANT POWER

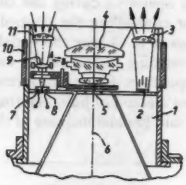
**August Hell, Feldkirchen; Kurt Borowski, Aschheim; Istvan Cocron, and Theodor Huber, both of Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany**

**Filed Apr. 9, 1979, Ser. No. 28,493**

**Claims priority, application Fed. Rep. of Germany, Apr. 7, 1978, 2815151**

**Int. Cl.³ G03B *3/00, 3/10***

**U.S. Cl. 354—25** **11 Claims**




1. In the focussing system of a photographic camera having exposure optics of adjustable subject-distance setting, in combination, means emitting radiation from the camera towards a subject to be photographed, receiving the radiation reflected back from the subject to the camera, and developing from the reflected back radiation a signal dependent upon the true camera-to-subject distance; and means operative for automatically controlling the power of the emitted radiation in dependence upon said signal.

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**4,313,656**

## WEIGHTING OF THE SCENE LIGHT SIGNAL DURING THE SHUTTER OPENING OPERATION

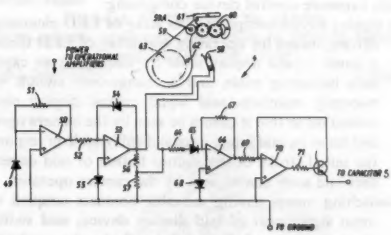
**Kurt Borowski, and Eduard Wagensonner, both of Aschheim, Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany**

**Filed May 29, 1980, Ser. No. 154,301**

**Claims priority, application Fed. Rep. of Germany, Jun. 6, 1979, 2922918**

**Int. Cl.³ G03B *7/083***

**U.S. Cl. 354—29** **10 Claims**




1. An improved photographic camera of the type having a light-totalizing circuit, including photosensitive means exposed to scene light, operative for generating an exposure signal indicating the amount of exposure of film, exposure terminating means operative for generating a terminating signal when the exposure signal has reached a predetermined value corresponding to a correct amount of exposure, and a shutter mechanism which when activated increases the exposure-aperture size gradually from a minimum value to a maximum value, whereby for scene light levels above a predetermined level the exposure is terminated before the maximum aperture

size can be reached, the final aperture size being relatively large for relatively low scene light levels and relatively small for relatively high scene light levels,

whereas for scene light levels below the predetermined level the exposure is terminated only after the maximum aperture size has been reached,

the improvement wherein:

the photosensitive means includes only a single photosensitive element,

controllable weighting circuit means receiving a signal from the photosensitive element and applying thereto a variable weighting factor, and

control means operative during the ongoing course of an exposure for controlling the controllable weighting circuit means so as to change the variable weighting factor during the ongoing course of the exposure in a manner which compensates for the progressive increase in the instantaneous amount of light entering the exposure aperture during said gradual increase of the exposure-aperture size.

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**4,313,657**

## DISPLAY DEVICE FOR FOCUS DETECTING AND INDICATING DEVICE FOR CAMERA

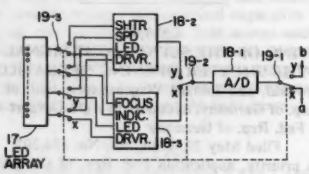
**Seijiro Tokutomi, Tokyo; Masao Jyojiki, Tsurugashima; Kazuo Nakamura, Shiki, and Harumi Aoki, Kiyose, all of Japan, assignors to Asahi Kogaku Jogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 21, 1980, Ser. No. 113,888**

**Claims priority, application Japan, Feb. 15, 1979, 54-18369[U]**

**Int. Cl.³ G03B *17/20, 13/18***

**U.S. Cl. 354—53** **2 Claims**




1. In a camera incorporating an electrical focus detecting and indicating device and an exposure metering or an automatic exposure control device comprising:

a display device comprising; an array of LED elements and driving means for operating said array of LED elements, a liquid crystal display scale for displaying an exposure data indicating scale, and a change-over switch which normally maintains said liquid crystal display element turned off so that it cannot be seen by the camera operator and turns on said liquid crystal display scale in response to the initial stroke of the shutter button of said camera so that said scale can be seen by the camera operator,

switching means having movable contacts coupled to an input signal port of said display device, said switching means being coupled to receive at first and second stationary contacts respectively a focus detection indication signal output and an exposure indication signal output, said switching means being normally set for connecting said focus detection indicating signal output to said display device to cause said array of LED elements to display a visible indication of said focus detection indicating output signal, and

said switching means being responsive to the initial stroke of said shutter button to cause said array of LED elements in conjunction with said liquid crystal display scale to display a visual indication of said exposure indicating signal output.

**4,313,658**

## CAMERA HAVING ELECTROMAGNETIC DRIVE SOURCE

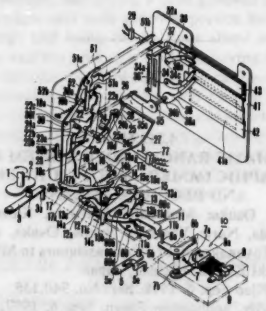
**Yoji Sugiura, Yokohama; Nobuaki Date, Kawasaki; Ryoichi Suzuki, Kawasaki, and Syuichiro Saito, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 20, 1980, Ser. No. 132,100**

**Claims priority, application Japan, Mar. 26, 1979, 54-35312; Oct. 1, 1979, 54-127194; Oct. 15, 1979, 54-132565; Feb. 25, 1980, 55-22510**

**Int. Cl.³ G03B *9/08, 19/12***

**U.S. Cl. 354—152** **13 Claims**



1. A camera having an electromagnetically driven shutter comprising:

(a) a front shutter curtain and a rear shutter curtain;

(b) electromagnetic drive source means responsive to supply of current for producing electromagnetic forces by which the front shutter curtain and the rear shutter curtain are individually driven to run down;

(c) means coupled to an electrical power source for supplying current to said electromagnetic drive source;

(d) shutter lock means arranged to engage said shutter front and rear curtains when they lie in positions ready to run down for rendering both shutter curtains inoperative; and

(e) lock release means for releasing said lock means prior to the supply of current to said electromagnetic drive source,

said shutter front and rear curtains being arranged to begin to travel when the electromagnetic drive source means receive the current supply from the control circuit after the release of the shutter lock means.

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**4,313,659**

## ELECTROMAGNETICALLY DRIVEN SLIT EXPOSURE SHUTTER

**Syuichiro Saito; Ryoichi Suzuki, both of Kawasaki, and Takashi Uchiyama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 22, 1980, Ser. No. 142,750**

**Claims priority, application Japan, Apr. 27, 1979, 54-52419**

**Int. Cl.³ G03B *9/42***

**U.S. Cl. 354—234** **11 Claims**

10. A slit exposure shutter, comprising:

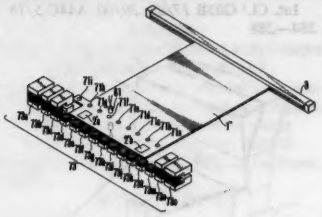
front shutter blade means and rear shutter blade means movable into and out of a light passage for blocking light through the passage;

a plurality of permanent magnet means mounted on the front shutter blade means and the rear shutter blade means for movement along a predetermined travel path;

a plurality of electromagnets disposed along the path and having magnetic poles which form a gap through which said permanent magnet means pass as they move along the path so that the magnetic poles of the electromagnets confront the poles of the permanent magnet means; and

supply means for energizing said electromagnets which

cause the poles of the electromagnets to repel the permanent magnet means as said permanent magnet means pass through the gaps and cause said front shutter blade means and said rear shutter blade means to float as they travel



through the gaps of the electromagnets, said electromagnets being arranged to attract the magnetic poles of said permanent magnet means when said electromagnets are not excited and to inhibit travel of said front shutter blade means and said rear shutter blade means.

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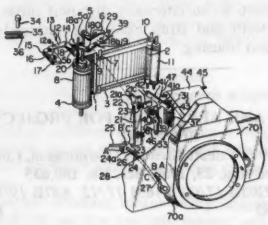
**4,313,660**

## RELEASE DEVICE FOR A CAMERA

**Yoshiyuki Nakano, Tokyo; Akihiko Sato, Kawasaki, and Masakazu Tomatsuri, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Dec. 8, 1980, Ser. No. 214,046**
**Claims priority, application Japan, Feb. 5, 1980, 55-12445[U]**
**Int. Cl.³ G03B *9/08, 17/38***
**U.S. Cl. 354—234** **4 Claims**



1. A camera having a shutter device capable of controlling the movement of a forward shutter curtain and/or a rearward shutter curtain by electromagnetic means operatively associated with the depression of a shutter button and which is capable of controlling the movement of said two shutter curtains by mechanical means instead of said electromagnetic means, said camera including a shutter release member for operating said mechanical means, said member having an operating portion provided on the outer surface of the camera separately from said shutter button.

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**4,313,661**

## ELECTROMAGNETIC RELEASE DEVICE FOR CAMERA

**Masayoshi Yamamichi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 20, 1980, Ser. No. 122,843**
**Claims priority, application Japan, Feb. 21, 1979, 54-19226**
**Int. Cl.³ G03B *9/08, 17/38***
**U.S. Cl. 354—235** **8 Claims**

1. An electromagnetic release device for use in a camera having a shutter, comprising:

(a) a shutter release mechanism movable from a cocked position to a rest position for releasing the shutter;

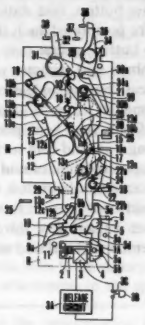
(b) holding means for releasably holding said shutter release mechanism at its cocked position;

(c) a core including a permanent magnet for providing a magnetic attractive force;

(d) release operation initiating means including an armature arranged to be retractably movable away from said core to disable said holding means to allow the movement of said shutter release mechanism to its rest position, said armature being attracted to said core by said magnetic attractive force;

(e) a coil cooperable with said permanent magnet for cancelling said attractive force upon energization of the coil;

(f) applying means for applying a biasing force to retractably move said armature of said release operation initiating



means from said core, said applying means being arranged to disable the application of the biasing force and to cut off the engagement of the shutter release mechanism and the release operation initiating means after said release operation initiating means has disabled said holding means and before said shutter release mechanism reaches its rest position; and

(g) biasing means coupled with said release operation initiating means and responsive to the disablement of said applying means for applying a biasing force to reset said armature on said core independently of said shutter release mechanism.

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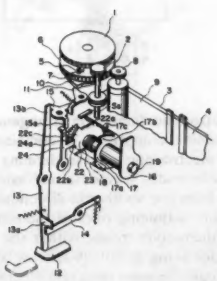
**4,313,662**

## SELF-TIMER DEVICE

**Hiroshi Kurei, Kawagoe, and Tahei Morisawa, Matsudo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 17, 1980, Ser. No. 112,984**
**Claims priority, application Japan, Feb. 26, 1979, 54-24014[U]**
**Int. Cl.³ G03B *9/64, 17/38***
**U.S. Cl. 354—237** **7 Claims**



1. A self-timer device for a camera comprising:

an external self-timer set lever rotatably mounted on the outside of the camera;

a first cam member rigidly coupled inside the camera to said set lever, said first cam member including a bent portion extending away from said set lever;

a second cam member;

a locking member mounted inside said camera;

an internal shaft and an external release button rigidly coupled to said second cam member, said shaft being rotatable with said set lever but axially movable relative thereto;

a stationary pin positioned adjacent to and parallel to said shaft; and

a self-timer switch activatable by said bent portion; wherein:

said self-timer lever, said first and second cam members, said shaft and release button, said stationary pin and said self-timer switch are positioned such that, prior to depression of said release button, a first cam surface of said second cam member abuts said stationary pin, and upon depression of said release button said second cam member moves inwardly beyond an edge of said stationary pin and is released therefrom, said bent portion of said first cam member abutting a second cam surface of said second cam member, and, upon rotation of said self-timer lever to a set position and release of said button, said self-timer switch is activated by said bent portion to start a time delay, said locking member engaging a third cam surface of said second cam member to hold said self-timer lever at the set position.

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**4,313,663**

## ELECTROOPTIC DIAPHRAGM AND CIRCUIT OPERATIVE FOR CAUSING THE DIAPHRAGM TO OPEN UP STEPWISE AND THEN CLOSE TO TERMINATE EXPOSURE

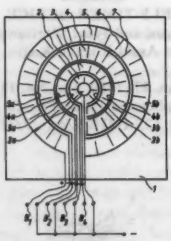
**Otto Stemme, Munich, and Eduard Wagensonner, Aschheim, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany**

**Filed Apr. 16, 1979, Ser. No. 29,911**

**Claims priority, application Fed. Rep. of Germany, Apr. 18, 1978, 2816851**

**Int. Cl.³ G03B *9/56*; G02F *1/13***

**U.S. Cl. 354—271** **9 Claims**



1. An electrooptic diaphragm arrangement for use in a photographic camera, comprising, in combination,

a layer of electrooptic material defining a general plane; and

a set of electrodes located along said general plane and spaced from one another in directions parallel to the general plane, adjoining ones of the electrodes defining between themselves zones within the general plane, said electrodes being relatively narrow and said zones being substantially broader than said electrodes,

whereby when potential differences are applied across selected pairs of electrodes the electrooptic states of selected ones of said zones are controlled by means of electric fields which pass parallel to said general plane through the electrooptic material within said zones.

**4,313,664**

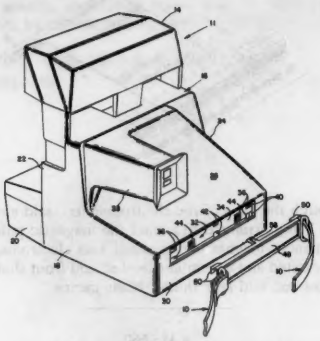
## CARRYING STRAP ATTACHMENT FOR CAMERA

**Fred M. Finnemore, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Dec. 29, 1980, Ser. No. 220,896**

**Int. Cl.³ G03B *17/02, 29/00*; A44C *5/18***

**U.S. Cl. 354—288** **14 Claims**



1. A photographic apparatus having a housing; a test terminal disposed in said housing and being electrically connected to at least one operational component that is to be tested so as to insure that the component functions in the manner intended, said housing having an access opening permitting said test terminal to be connected to a test source external of said housing; a cover member connected to said housing in covering relation to said access opening and said terminal, and a carrying strap connected to an internally disposed surface of said cover member with said strap extending exteriorly of said cover member and housing.

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**4,313,665**

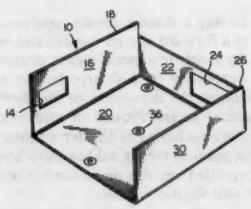
## METHOD AND APPARATUS FOR PROJECTOR SUPPORT

**Jerold B. Spitz, 9 G Talcott Glen Rd., Farmington, Conn. 06032**

**Filed Aug. 25, 1980, Ser. No. 180,635**

**Int. Cl.³ G03B *17/00*; F16M *11/12*; A47B *19/00***

**U.S. Cl. 354—293** **19 Claims**



1. The combination of a projector and mount comprising:

a. a projector operable to project an image on a remote surface; and

b. a mount supporting said projector and including a generally planar base portion having mounting means on its lower surface including a threaded aperture for seating the screw of an associated tripod or the like to support said mount on the associated tripod, said mount further including at least a pair of sidewall portions on opposite sides of said base portion and extending in the same generally vertical direction therefrom along at least a major portion of the length of said opposite sides, said projector resting on the upper surface of said base portion, said mount being dimensioned and configured for disposition

of said remote edges of said sidewall portions on a generally horizontal planar support surface to support said base portion above the support surface and thereby enable said mount to support said projector above the support surface when said mount is not supported on the associated tripod.

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**4,313,666**

## APPARATUS FOR DEVELOPING LIGHT-SENSITIVE RECORDING MATERIALS

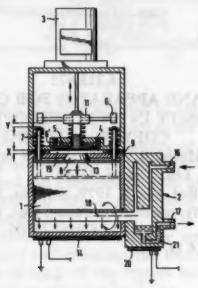
**Jochen Koblo, Wiesbaden-Auringen, and Götz von dem Bussche, Schwalbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Jun. 27, 1980, Ser. No. 163,583**

**Claims priority, application Fed. Rep. of Germany, Jun. 28, 1979, 2926084**

**Int. Cl.³ G03D *7/00***

**U.S. Cl. 354—299** **7 Claims**



**1.** An apparatus for developing light-sensitive recording material with a vaporous developing medium in a developing chamber, comprising housing means having a vapor space therein,

aperture means in said vapor space,

external and internal pressure means adapted to close said aperture means,

said external pressure means having a height of lift X between the top of the housing and a final position of the external pressure means, and being equipped with heating means,

said internal pressure means being adapted to close said aperture means in a gas-tight manner and having a height of lift Y, between a driving element for said internal pressure means and a closure guide means for said internal pressure means, which is greater than X,

and vaporizer means connected to said vapor space.

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**4,313,667**

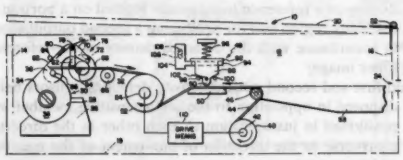
## FILM PROCESSOR HAVING AUTOMATICALLY ACTUATED FILM SEVERING MEANS

**Nicholas Gold, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Nov. 17, 1980, Ser. No. 207,362**

**Int. Cl.³ G03D *5/06***

**U.S. Cl. 354—303** **10 Claims**



**1.** Apparatus for receiving a film cassette containing a roll of exposed, self-developing type transparency film preparatory to processing the film, the roll of film being wound upon a spool and having one end thereof secured to the spool and an opposite end extending to the exterior of the film cassette via a film withdrawal slot, said apparatus comprising:

a housing defining a lighttight enclosure in which photographically exposed film is adapted to be processed, said housing including a loading door providing access to the interior of said housing;

first means for supporting a film cassette containing a roll of exposed, self-developing type transparency film;

second means for supporting a supply of sheet material;

means for withdrawing the sheet material and the exposed film from said second supporting means and the film cassette and orientating them in superposition, said withdrawing means being adapted to provide a back tension in the film after the film has been unwound from its spool which is sufficient to reorientate the film cassette relative to said first supporting means;

first drive means for driving said withdrawing means in a direction so as to superpose the sheet material and the exposed film;

means for applying a coating of processing composition to one side of either the sheet material or the film prior to said superpositioning, the processing composition being adapted to initiate the formation of visible images in either the film or the sheet material;

means for severing the film to be superposed with the sheet material from its attachment to the spool within the film cassette; and

means responsive to the reorientation of the film cassette relative to said first supporting means for activating said severing means to thereby separate the one end of the film from the film being superposed with the sheet material.

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**4,313,668**

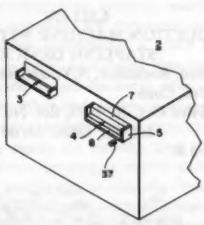
## CONTROL CIRCUIT FOR A FILM PROCESSING APPARATUS

**Henry F. Hope, 3192 Huntingdon Rd., Huntingdon Valley, Pa. 19006, and Stephen F. Hope, 2321 Wyandotte Rd., Willow Grove, Pa. 19090**

**Continuation-in-part of Ser. No. 756,556, Jan. 3, 1977, Pat. No. 4,171,940, which is a continuation-in-part of Ser. No. 692,196, Jun. 2, 1976, Pat. No. 4,130,385, which is a division of Ser. No. 530,685, Dec. 9, 1974, Pat. No. 3,966,868. This application Aug. 21, 1978, Ser. No. 935,527**

**Int. Cl.³ G03D *3/08*; B29C *3/00***

**U.S. Cl. 354—319** **8 Claims**



**1.** In an apparatus for the processing of a curled leading edge of a coiled strip of film, the apparatus comprising a pair of platens, having grooves which combine to impress longitudinal corrugations into the leading edge of the film inserted therebetween, the platens being adapted to move from a non-contact position to a contact position, and then back to the non-contact position, and a means for moving the platens to their contact position upon the placement of the leading edge of film therebetween and to return the platens to their non-contact position at a preselected time thereafter, in response to signals from a control circuit, an improved control circuit comprising

switching means capable of causing the platens to move

either from a non-contact position to the contact position or from the contact position to a non-contact position irrespective of the position of the platens with respect to each other.

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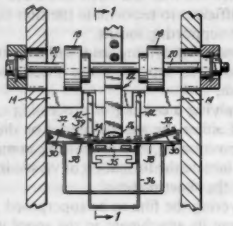
**4,313,669**

## PHOTOGRAPHIC PRINT STACKING TRAY

**Louis A. Larson, Golden Vallue, and Charles L. Euteneuer, St. Michael, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.**

**Filed Oct. 27, 1980, Ser. No. 200,932**
**Int. Cl.³ G03B *19/00*; B65H *31/20***
**U.S. Cl. 354—354** **8 Claims**



1. A photographic print stacking tray device for stacking individual photographic prints as they are discharged in a machine direction from a discharge end of a print conveying apparatus, the device comprising:

tray means positioned generally below the discharge end to receive individual photographic prints and collecting the prints in a stack as the prints are driven in the machine direction out of the discharge end, the tray means being concavely bowed in a transverse direction; and

central deflection means for deflecting each individual print driven from the discharge end downward toward the tray means, the central deflection means engaging a central portion of the print to cause the print to generally conform to the concave bow of the tray means in the transverse direction as it is stacked, and wherein the central deflection means has a lower end portion for engaging the stack of prints proximate the center of the stack such that the stack of prints is retained in a transversely bowed configuration.

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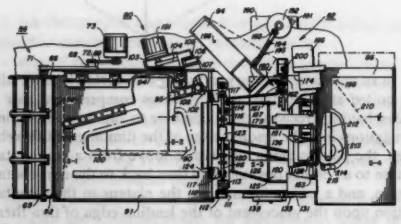
**4,313,670**

## REPRODUCTION MACHINE WITH A PIVOTAL STAPLING DEVICE

**John R. Caldwell, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Oct. 30, 1979, Ser. No. 89,336**
**Int. Cl.³ G03G *15/00***
**U.S. Cl. 355—3 R** **3 Claims**



1. In an electrostatographic reproduction system having a document handling apparatus for advancing document sheets to an exposure station, an electrostatographic processor for processing copy sheets, and an apparatus for producing attached sets of copy sheets, the improvement comprising:

means for moving processed copy sheets in a predetermined path of movement and compiling copy sheets preparatory to attaching the same into sets,

copy sheet attaching apparatus arranged, when in an operative position, to apply a fixing element to a corner of a compiled set, said attaching apparatus being mounted on a pivotal axis and arranged to be pivoted from an inoperative position out of said predetermined path, toward the same, and back to said inoperative position in sequence during a fixing operation,

drive means associated with said attaching apparatus for effecting said pivoting thereof when a set has been collected by said compiling means.

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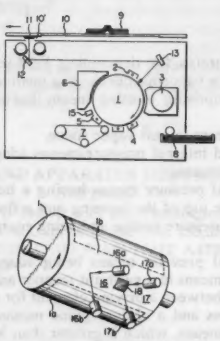
**4,313,671**

## METHOD AND APPARATUS FOR CONTROLLING IMAGE DENSITY IN AN ELECTROPHOTOGRAPHIC COPYING MACHINE

**Hiroshi Kuru, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed Apr. 9, 1979, Ser. No. 28,203**
**Claims priority, application Japan, Apr. 14, 1978, 53-43303**
**Int. Cl.³ G03G *15/00***
**U.S. Cl. 355—14 D** **3 Claims**



1. An apparatus for detecting image density in an electrophotographic copying machine having an operatively movable photosensitive member, comprising:

a first optical density detecting sensor for detecting the density of a blank region on the photosensitive member in which region no toner image of an original to be copied is formed and for producing a first output signal in accordance with the detected density;

a second optical density detecting sensor for detecting the density of a reference toner image formed on a portion of the blank region and for producing a second output signal in accordance with the detected density of the reference toner image;

said first and second optical density detecting sensors being disposed in opposition to the photosensitive member and positioned in juxtaposition to each other in the direction transverse to the direction of movement of the member; and

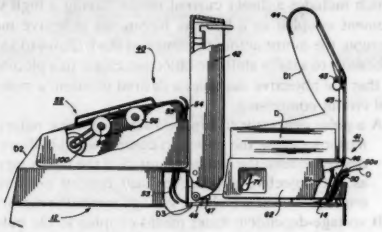
electrical means for receiving said first and second output signals and for differentially producing a control signal in accordance therewith for enabling a control of image density.

4,313,672

## STEPPER MOTOR DRIVE SYSTEM IN COMPUTER FANFOLD REPRODUCTION

Russell G. Schroeder, II, Rochester, and Joseph W. Ward, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 17, 1979, Ser. No. 75,866
Int. Cl.³ G03G 15/00
U.S. Cl. 355—14 R 5 Claims



1. In a reproduction machine adapted to handle either individual documents, or document material in the form of a computer fanfold web consisting of a plurality of frame sections, the machine having an exposure platen on which said frame sections are positioned and a register element adjacent one side of the platen for locating an edge of each frame during copying thereof, the combination of:

a motor and a drive thereof actuatable upon the web to advance the same and effecting the location of a corresponding edge of each of the frames being reproduced adjacent the registration element,

a circuit connected to said motor for energizing the same,

means for generating a stream of pulses in said circuit for imparting stepped actuation of said motor thereby imparting incremental advancement of the fanfold web applicable to each frame, said circuit having means for producing a predetermined number of pulses for a preselected size of the frame of the fanfold web, and

means for varying the predetermined number of said pulses in accordance with different sizes of frames of material to be reproduced.

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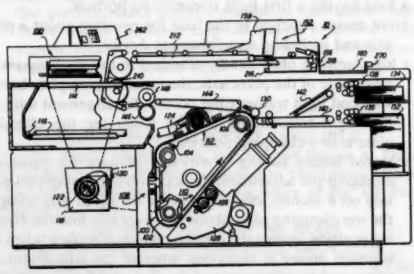
4,313,673

## DUPLEX OPERATION IN A REPRODUCTION MACHINE

Raymond C. Wartinger, Webster; Charles D. Braswell, Rochester; Neal S. Buchalter; John W. Daughton, both of Fairport, and Robert G. Ellis, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1979, Ser. No. 89,331
Int. Cl.³ G03G 15/00
U.S. Cl. 355—14 R 5 Claims



5. In a reproduction machine for producing impressions of an original, the combination of a photosensitive member and a plurality of operating components cooperable with one another and the photosensitive member to produce the impressions on support material, a billing meter, a tray for feeding the support material, a second tray providing a buffer storage for duplex operation, a finisher area having a receiving tray,

means to determine an odd number of documents to be copied,

means to schedule a blank sheet and

means to inhibit billing of the blank sheet.

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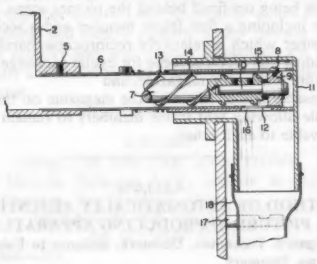
4,313,674

## CLEANING APPARATUS FOR COPYING OR THE LIKE

Hiroaki Ura, and Hiroyuki Honda, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1979, Ser. No. 105,909
Claims priority, application Japan, Dec. 27, 1978, 53-177291[U]
Int. Cl.³ G03G 21/00
U.S. Cl. 355—15 5 Claims



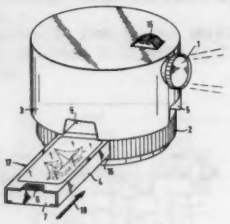
3. In an electrophotographic copying machine having a detachable cleaning apparatus for removing and recovering toner, the improvement comprising: a toner recovery box having a discharge opening, an exhaust pipe having an open entrance end connected to said discharge opening and an exit opening proximate its other end, means closing the said other end of said pipe, toner conveyor means supported within said pipe by said closing means for moving toner from the open entrance end to said exit opening, a shutter slidably mounted relative to said pipe and having an opening therethrough corresponding to the exit opening in said pipe, a hopper positioned to receive toner from the exit opening of said pipe and having an end wall adapted to be positioned adjacent the closed end of the pipe when the cleaning apparatus is connected to the copying machine, and spring means normally urging said shutter outwardly from the closed end of said pipe so that the exit opening of the pipe is normally out of alignment with the opening in said shutter and said exit opening is thereby closed, whereby when said cleaning apparatus is attached to the copying machine, said shutter is pressed against the end wall of said hopper to move the shutter relative to said pipe and against the action of said spring so that the openings in said pipe and said shutter coincide to permit toner moving through said pipe to be discharged.

4,313,675

## EPISCOPE

Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

Filed Oct. 9, 1979, Ser. No. 82,772
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1978, 2844282; Apr. 9, 1979, 2914283
Int. Cl.³ G03B 27/52, 23/14
U.S. Cl. 355—40 41 Claims



1. A device for displaying sheet shaped opaque pictures comprising

a housing with an image transmitting means facilitating display of the image at the exterior of the housing, there being a picture scene in the housing from which the image emanates,

a picture exchange magazine having a display window at the picture scene and means confining a stack of pictures with the top picture in the stack being disposed at the window and picture scene and the remainder of the pictures in the stack being confined behind the picture scene, the magazine including a first frame member and a second frame member which is relatively reciprocable parallel to said window and pictures scene for cyclic exchange of the top picture within the magazine, and

a releasable holder retaining the magazine on the housing, while allowing said frame members to remain relatively movable to each other.

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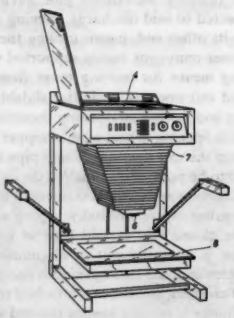
4,313,676

## METHOD OF AUTOMATICALLY ADJUSTING A PICTURE REPRODUCING APPARATUS

Sven Nygaard, Trekanten, Denmark, assignor to Eskofot, A/S, Ballerup, Denmark

Filed Dec. 26, 1979, Ser. No. 107,381
Claims priority, application Denmark, Jan. 11, 1979, 117/79
Int. Cl.³ G03B 27/34, 27/40
U.S. Cl. 355—56 4 Claims



1. A method of adjusting a picture reproducing apparatus such as for instance a camera, which comprises an original plane, an objective plane, and a picture plane, by means of one or more driving means in the form of a plurality of direct-current motors with a high starting moment, characterized by the direct-current motors being controlled by supplying a series of voltage pulses thereto, the torque required of the motor increasing as the motor approaches a desired position of adjustment, as a consequence of which the voltage across the motor drops, the individual motor being stopped after each supply of pulses, and by the width of the pulses being regulated in response to the voltage across the motor.

4. In a picture reproducing apparatus such as a camera which includes a direct current motor having a high starting moment coupled to a bellows having an objective mounted thereon, the motor acting to compress the bellows to an extent necessary to axially shift the objective closer to a picture plane so that the objective occupies a desired position, a motor-control circuit comprising:

A a pulse generator to supply a series of drive pulses to the motor to cause the motor to compress the bellows to the desired extent, the torque required of the motor increasing as the objective approaches said desired position, as a consequence of which the voltage across the motor drops;

B voltage-dependent timer means coupled to the pulse generator to vary the width of the pulses supplied to the motor; and

C means responsive to the voltage developed across the motor and coupled to said timer to vary the width of the pulses as a function of said motor voltage.

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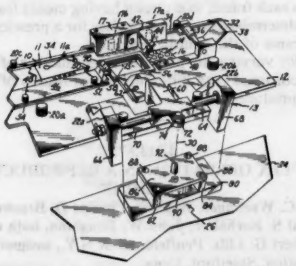
4,313,677

## NEGHOLD ASSEMBLY FOR PHOTOGRAPHIC PRINTER

James F. Stewart, Shoreview, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Mar. 3, 1980, Ser. No. 126,871
Int. Cl.³ G03B 27/62, 27/64
U.S. Cl. 355—76 10 Claims



1. A neghold assembly for use in a photographic printer comprising:

a base having a first light transmitting portion;

pivot means attached to the base for pivoting about a pivot axis and including an adjustment device;

a top clamping plate fixedly attached to the pivot means on a first side of the pivot axis, the top clamping plate having a second light transmitting portion for alignment with the first light transmitting portion when the top clamping plate is in a clamping position;

solenoid means having a movable plunger for upwardly engaging the adjustment device with increasing energization on a second, opposite side of the pivot axis pivoting the top clamping plate about the pivot axis into the clamping position against the bottom clamping surface when the solenoid means is energized wherein the adjustment device provides adjustment of the clamping force applied by the top clamping plate when the solenoid means is in a full energization state; and

bias spring means for pivoting the top clamping plate about

the pivot axis from the clamping position to an open position when the solenoid means is deneergized.

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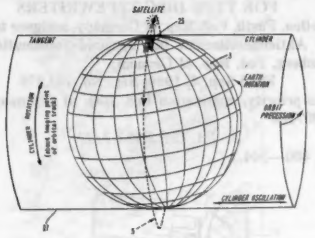
**4,313,678**

## AUTOMATED SATELLITE MAPPING SYSTEM (MAPSAT)

**Alden P. Colvocoresses, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.**

**Filed Sep. 24, 1979, Ser. No. 78,358**
**Int. Cl.³ G01C 7/02**
**U.S. Cl. 356—2** **10 Claims**




1. A method for acquiring panchromatic or multispectral topographic data of a celestial body through the use of a relatively stable platform spaced from said body and movable relative thereto, said platform carrying at least first and second linear array sets of radiometric sensing detectors aligned transversely to the direction of platform motion, said first and second sets being positioned on said platform at different angles from a geometric vertical with respect to the body for respectively sensing radiance from spaced areal elements of said body, comprising the steps of:

moving said platform across said body for sensing linear strips constituted by said areal elements of said body in a direction substantially parallel to the motion of said platform,

continuously sensing said areal elements by scanning said linear strips with said first array set from a first position on said platform to produce flows of signal elements representative of one-dimensional spatial and radiometric information,

continuously sensing the corresponding strips by scanning them with said second array set from a second position on said platform at said different angle aspect in epipolar planes defined by corresponding said first and second positions and said areal elements corresponding thereto, to produce a second series of flows of signal elements representative of one-dimensional spatial and radiometric information, and

comparing the signal elements of said first signal flows with the corresponding signal elements of said second signal flows within the same epipolar planes to derive output signals indicative of elevational information for each areal element of each sensed strip.

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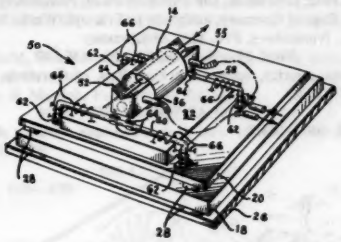
**4,313,679**

## TEST SAMPLE SUPPORT ASSEMBLY

**Ernest G. Wolff, Rolling Hills Estates, and Steven A. Eselun, Long Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Nov. 29, 1979, Ser. No. 98,429**
**Int. Cl.³ G01N 21/01; G01B 11/02; G01N 25/16**
**U.S. Cl. 356—244** **8 Claims**

1. In a contactless length measuring device having a chamber for housing optical equipment for performing the length measurement operation of a sample and means for providing a preselected temperature within said chamber, the improvement therein being in the form of a support assembly located within said chamber for holding said sample in optical alignment with said optical equipment, said sample support assembly comprising a main support on which said optical equipment is mounted, said main support being made of a material having ultra-low expansion properties, a first insulating member juxtaposed said main support, said first insulating member being made of a material having relatively high thermal conductivity thereby substantially eliminating temperature gradients in said main support, a second insulating member juxtaposed said first insulating member, said second insulating member being made of an open porous material, means made of a thermally conductive material juxtaposed said second insulating member for supporting said sample in optical alignment with said optical equipment, said means for providing said preselected temperature being directly connected to said sample support means, and means interposed between said first insulating member and said sample support means for adjustably mounting said sample support means thereon whereby said main support and said optical equipment are rendered substantially unaffected by said preselected temperature within said chamber.



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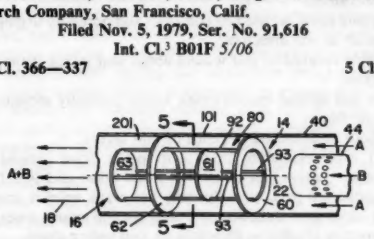
**4,313,680**

## REACTOR FOR FAST REACTIONS

**Lewis R. Honnen, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Nov. 5, 1979, Ser. No. 91,616**
**Int. Cl.³ B01F 5/06**
**U.S. Cl. 366—337** **5 Claims**




1. A reactor for mixing fluid components, comprising:

a cylindrical housing defining a reaction chamber having an intake and a discharge through which a stream of fluid components is to flow;

a plurality of annular-shaped flow-converging members extending longitudinally within said reaction chamber between the intake and discharge, and spaced from each other and extending from the inner walls of said housing to define a channel within said housing along the central axis of said reaction chamber for the flow of the fluid components along said central axis;

a flow-deflecting disc-shaped element disposed in said channel downstream of each of said flow-converging members to intercept substantially all of the body of fluid flow to divide the body of fluid and to divert the flow approximately 90° from said central axis to flow around said flow-deflecting element, said disc-shaped elements having

an area substantially equal to the area of said opening in said annular-shaped members;

an annular inlet means having a substantially coextensive outer perimeter with said reaction chamber housing for introducing a first reactant to said chamber; and

sparger means for introducing a second reactant into the annulus defined by said inlet means in an initially generally perpendicular flow pattern to said first reactant.

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**4,313,681**

## TYPE DISC POSITIONING MECHANISM

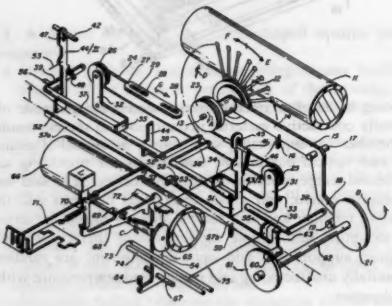
**Josef Lendl, Ottensoos, and Diethelm Puch, Nuremberg, both of Fed. Rep. of Germany, assignors to Triumph-Werke Nurnberg A.G., Nuremberg, Fed. Rep. of Germany**

**Filed May 1, 1980, Ser. No. 145,749**

**Claims priority, application Fed. Rep. of Germany, Apr. 5, 1979, 2918026**

**Int. Cl.³ B41J *1/30***

**U.S. Cl. 400—144.2** **6 Claims**



1. A typewriter including

a rotatably mounted shaft,

a type disc having character supporting spokes secured to said shaft,

a spring drum secured to said shaft and normally urging said shaft in one direction,

a cable secured to and wound about said spring drum,

a frame,

first and second spaced crank levers pivotally mounted on said frame,

pulleys mounted on the ends of said levers,

said cable extending from said spring drum around said space pulleys and connected at its other end to a frame supported part, whereby said first crank lever is urged in a clockwise direction and said second crank lever in a counter clockwise direction by said spring drum,

first and second rocker bars located in the path of said first and second crank levers,

first means for limiting the rocking movement of said first rocker bar under urging by said first crank lever,

second means for limiting rocking movement of said second rocker bar under urging of said second crank lever thereby establishing a home position of said type disc,

a cyclically operable drive lever pivoted intermediate its ends defining first and second arms,

an array of key selectable interposers arranged for movement between the arms of said cyclically operable drive lever and said first and second rocker bars, and

key controlled means for moving a selected interposer between said first and second arms of said drive lever and said first and second rocker bars and for cycling said drive lever,

said key controlled means including means for releasing said second means to allow movement of said second rocker bar when the interposer selected is between said second arm and said second rocker bar,

said drive lever acting to drive said first rocker bar or allow movement of said second rocker bar through an angle determined by the location of a selected interposer relative to the pivot of said drive lever to cause angular movement from home position of said first and said second pulley levers and corresponding movement of said type disc to a selected position.

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**4,313,682**

## FINAL POSITIONING VIBRATION DAMPING DEVICE FOR TYPE DISC TYPEWRITERS

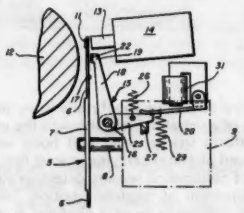
**Rolf Theilen, Furth, Fed. Rep. of Germany, assignor to Triumph-Adler Aktiengesellschaft fur Buround Informationstechnik, Nuremberg, Fed. Rep. of Germany**

**Filed Sep. 4, 1980, Ser. No. 183,978**

**Claims priority, application Fed. Rep. of Germany, Feb. 26, 1980, 3007108**

**Int. Cl.³ B41J *1/32***

**U.S. Cl. 400—144.3** **5 Claims**



1. In a typewriter or like machine having a platen, an axially movable printing hammer supported opposite a printing point on said platen, a type disc located between said platen and printing hammer having flexible spokes extending radially from a common axis, said spokes carrying type at the ends thereof on the side facing said platen, and means for rotating said type disc to present a selected spoke opposite said printing hammer, whereby printing hammer movement will impact the type on the selected spoke against said printing point, the improvement comprising

aligning and vibration damping means mounted for movement toward the side of said type disc facing said print hammer to flex the spoke selectively positioned opposite the printing hammer toward said platen and to touchingly engage several spokes to either side of said selected spoke thereby to align said selective spoke and damp axial and rotary vibrations of said type disc, and

means for moving said aligning and vibration damping means toward said type disc after a selected spoke has been positioned and in advance of printing hammer movement.

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**4,313,683**

## MICROCOMPUTER CONTROL OF RIBBON DRIVE FOR PRINTERS

**Earl T. Brown, and Barry R. Cavill, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 19, 1979, Ser. No. 86,567**

**Int. Cl.³ B41J *33/14***

**U.S. Cl. 400—225** **9 Claims**

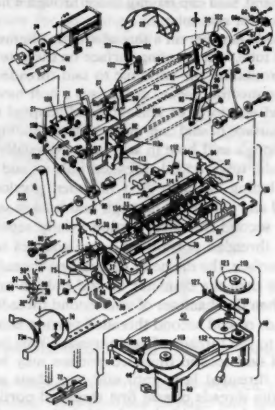
1. A ribbon control system for a printer unit having various assemblages for printing of characters on forms including a forms feed assembly and a print assembly, comprising:

a ribbon drive assembly in said printer unit including means to mount a pair of ribbon spools and motor drive means including a pair of ribbon drive motors individually asso-

ciated with said ribbon spools, said ribbon spools and related motor drive means serving alternately as ribbon supply and ribbon takeup during printing operations;

means for mounting a ribbon on said spools for guiding past a print station in said printer unit; and

a microcomputer interconnected directly with said ribbon drive motors and serving as a ribbon control element, said microcomputer issuing drive control signals as required in



order to activate said ribbon drive motors on a selective and alternate basis during operations of said printer unit to thereby drive said ribbon between said ribbon spools and said microcomputer being further responsive to emitter signals provided by said motors to monitor for proper movement of said ribbon, and to perform other ribbon control functions such as diagnostics and ribbon slack removal.

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**4,313,684**

**RECORDING APPARATUS**

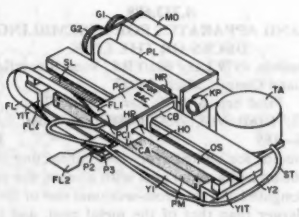
**Shigemitsu Tazaki, Matsudo; Shigeru Okamura, and Hiroshi Kyogoku, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 24, 1980, Ser. No. 133,141**

**Claims priority, application Japan, Apr. 2, 1979, 54-39476**

**Int. Cl.³ B41J *19/00*; G01D *15/18***

**U.S. Cl. 400—322** **4 Claims**



1. A recording apparatus, comprising:

linear motor means;

a recording head driven by said linear motor means and having plural recording means;

a first position being the rest position of said recording head;

a second position being adapted to reverse a running direction of said recording head and being located closer to a printing field as comparing with the location of said first position to the printing field;

means for applying a recording instruction signal to said recording head; and

means for causing said recording head to rest at said first position in the absence of a recording instruction signal from said applying means and to reverse the running direction of said recording head at said second position in the presence of the succeeding recording instruction signal.

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**4,313,685**

**PUSH-BUTTON SWITCH, PARTICULARLY FOR KEYBOARDS OF TYPEWRITERS AND SIMILAR DEVICES**

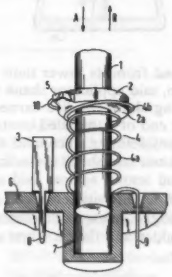
**Horst Stahl, Weidach, and Walter Wachs, Krailling, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Nov. 29, 1979, Ser. No. 98,406**

**Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2854096**

**Int. Cl.³ B41J *5/08***

**U.S. Cl. 400—479** **13 Claims**



1. A push-button switch, particularly for keyboards in typewriters and similar devices, comprising an actuating member movable from a rest position to a working position, a stationary contact, and a continuous helical spring member which forms a movable contact cooperable with said stationary contact, said spring member having two connected spring sections, a first spring section which is arranged to engage and apply force biasing said actuating member to its rest position and a second spring section which is arranged to resiliently engage said stationary contact when said actuating member reaches an intermediate position during movement thereof from its rest to its working position, wherein said second spring section is tensioned upon continuation of movement of said actuating member past said intermediate position to provide firm seating engagement of said second spring section with said stationary contact and said second spring section is so disposed relative to said actuating member and said first spring section that said second spring section attenuates final return movement of said actuating member into its rest position.

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**4,313,686**

**CONTAINER CAP WITH NECK ABUTTING RETRACTABLE APPLICATOR**

**Charles L. Proffer, P.O. Box 206, Gulfport, Miss. 39501**

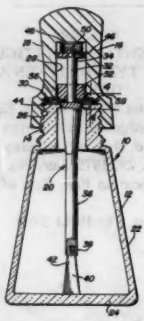
**Filed Feb. 4, 1980, Ser. No. 118,569**

**Int. Cl.³ A46B *11/00***

**U.S. Cl. 401—127** **16 Claims**

1. A screw cap and dispenser combination for reaching substantially completely to the bottom of the interior of an associated container, said combination including a cap body defining a first downwardly opening lower threaded recess therein for threadingly receiving a threaded container neck

and a second upper applicator shank mounting recess within said cap body above said first recess and opening downwardly thereinto, an elongated upstanding dispenser shank including liquid pickup means on its lower end, mounting means mounting the upper end of said dispenser shank in said second recess for limited vertical shifting therein as well as rotation of said shank about its longitudinal axis relative to said cap body, said shank and cap body including coacting means operable to releasably key said shank to said cap body against rotation of said shank relative to said cap body responsive to movement of



said shank upper end from its lower limit position toward its upper limit position, said applicator shank including a radially outwardly projecting abutment disc carried thereby for abutting with the outer end of a threaded container neck, said cap body including means defining an annular shoulder at the inner end of said first recess, said shank including a circumferential flange opposing and seated against said shoulder when said shank is in the upper limit position thereof, said coacting means including interfittingly engageable detent and projection means on said shoulder and flange when said shank is in said upper limit position.

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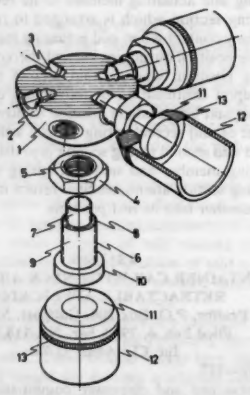
**4,313,687**

## PREFABRICATED SPATIAL STRUCTURE

**Juan Martinez Apeztegui, Jose Ma Salaverria 13-8°, and Ignacio Odriazola Espinosa de los Monteros, Sagrada Familia 4,9°, both of San Sebastian, Spain**

**Filed Sep. 5, 1978, Ser. No. 940,513**
**Int. Cl.³ F16B** *7/00*
**U.S. Cl. 403—171** **10 Claims**



**1.** In a prefabricated spatial structure of the type including a plurality of nodes, a plurality of rods extending between and structurally joined to selected said nodes to form a predesigned spatial configuration, and connecting means for joining each end of each said rod to a respective said node, the improvement wherein:

for each adjacent pair of said nodes to be connected by a said rod, the spacing between the centers of said pair of nodes, taken along the axis of said rod, comprises a predetermined first distance;

each said rod comprises a tube having a closed periphery and opposite ends, a cap fixedly joined to and closing each said tube end, said cap having therethrough a hole aligned coaxially with said tube;

each said node has therein a threaded hole aligned coaxially with said tube, and a seating surface on the exterior of said node surrounding the entrance to said threaded hole;

each said connecting means comprises a bolt having a head positioned interiorly of said tube and adapted to abut the interior surface of said cap, and a stem extending from said head, through said hole in said cap and axially exteriorly of said tube toward said threaded hole in said node, said stem including an inner first threaded portion adjacent said head and extending through said hole in said cap and an outer second threaded portion axially separated from said first threaded portion by a step adapted to abut said seating surface, the diameter of said first threaded portion being less than the diameter of said hole in said cap and greater than the diameter of said second threaded portion, the threads of said second threaded portion being complementary to the threads of said threaded hole in said node such that said second threaded portion may be threaded into said threaded hole until said step abuts said seating surface, the threads of said first threaded portion extending oppositely to said threads of said second threaded portion, and nut means threaded onto said first threaded portion for, upon rotation of said nut means and due to the opposite threading directions of said threads of said first and second threaded portions, selectively connected said rod to or disconnecting said rod from said node by creating relative threading rotation between said second threaded portion and said threaded hole in said node, thereby impart relative axial movement of said bolt with respect to said rod and to said node, and by creating relative threading rotation between said nut means and said first threaded portion, to thereby impart relative axial movement of said nut means with respect to said cap;

for said adjacent pair of nodes, the spacing between seating surfaces comprises a predetermined second distance; and

when said rod is disconnected from said pair of nodes, the total length of said rod and the portions of said bolts extending axially beyond the ends of said rod is less than said predetermined second distance, such that said rod may be connected to or disconnected from said nodes without alteration of said predetermined first distance.

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**4,313,688**

## METHOD AND APPARATUS FOR ASSEMBLING WOOD DECKS OR THE LIKE

**Phillip D. Daniels, 4979 Lake Bluff Rd., West Bloomfield Township, Oakland County, Mich. 48033**

**Filed Sep. 6, 1979, Ser. No. 73,073**
**Int. Cl.³ F16B** *7/08, 9/00;* **E04B** *1/56;* **E04C** *1/32*
**U.S. Cl. 403—189** **17 Claims**

**1.** A connector for alternatively interconnecting a wooden post with a beam and a metal post with a beam, the post being vertically elongated and the cross-sectional size of the wooden post being larger than that of the metal post, and the beam lying closely adjacent to the end of the post, the beam being rectangular in cross-sectional configuration and having its longitudinal axis normal to and aligned with the axis of the post,

said connector comprising two complementary support elements each overlapping the juncture of the post and the beam, said elements, in combination, having first end portions partially embracing the end of the post and sec-

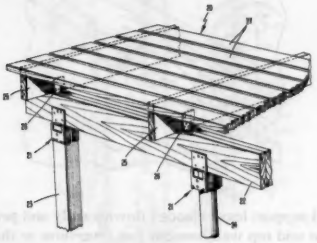
ond portions contacting the opposite sides of the ajacent beam,

said first end portions each having a central web lying parallel to the axis of the post and integral sides projecting normally from the central web,

said second end portions each being planar for contacting opposite sides of said beam,

and a flange integral with each support element and located intermediate said first and second end portions to project inwardly therefrom for overlying the end of said post,

fastener means for securing said beam to the second end portions of said elements, and



alternate means for securing said elements, respectively, to the post,

said alternate means, where the post is wooden, comprising fastener means for projecting through said first end portions of said elements and into the wooden post, and

said alternative means, where the post is metal, comprising a stabilizing plate separate and distinct from said elements, said plate (1) being of a size to fit between said elements when assembled on a metal post, (2) having a central aperture receiving said metal post therethrough and (3) being fixedly interconnected to the two elements to center the elements on the metal post in spaced relation to the end of the post.

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**4,313,689**

## SET OF PAVING ELEMENTS FOR PRODUCTION OF PAVING AND METHOD OF USING THE SAME

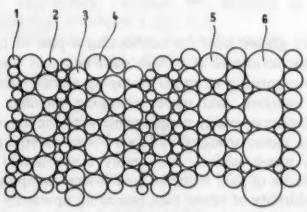
**Hans Reinschütz, Geigersbergstrasse 2, 7500 Karlsruhe 41, Fed. Rep. of Germany**

**Filed Aug. 26, 1977, Ser. No. 828,094**

**Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 7627698**

**Int. Cl.³ E01C *5/00***

**U.S. Cl. 404—73** **8 Claims**




1. A method of producing paving for paths, open spaces and the like comprising the steps of providing a plurality of sets of paving elements, each set comprising four cylindrical paving elements of different diameter, said four paving elements of each set having a predetermined specific diametric proportion to each other so as to permit a number of different predetermined strip combinations of paving to be laid utilizing said plurality of sets, wherein the paving elements in said strip combinations are so close together that they are in mutual contact, and wherein said predetermined strip combinations can at random be laid next to each other so that adjacent paving elements are in mutual contact thereby producing a paving which looks random and arbitrary although it is laid according to a precise system, and laying at least one of said predetermined strip combinations of paving using paving elements from said plurality of sets of paving elements, and wherein a predetermined strip combination of paving is laid utilizing the smallest, second smallest and largest paving elements of the four cylindrical paving elements in the sets of paving elements; a predetermined strip combination of paving is laid utilizing the second smallest, third smallest and largest paving elements of the four cylindrical paving elements in the sets of paving elements; and a predetermined strip combination of paving is laid utilizing the smallest and third smallest paving elements of the four cylindrical paving elements in the sets of paving elements; the paving elements in each strip of paving being laid in mutual contact and the predetermined strips of paving being laid next to each other so that adjacent paving elements are in mutual contact thereby forming a paving which looks random and arbitrary although it is laid according to a precise system.

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**4,313,690**

## ASPHALT LAYING MACHINE

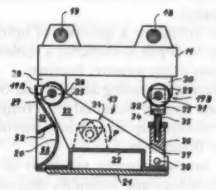
**Svend Hojbjerg, Vejen, Denmark, assignor to AS Phonix, Vejen, Denmark**

**Filed Jan. 8, 1980, Ser. No. 110,488**

**Claims priority, application Denmark, Dec. 14, 1977, 5562/77; United Kingdom, Dec. 11, 1978, 47918/78; Fed. Rep. of Germany, Dec. 12, 1978, 2853601; Netherlands, Dec. 14, 1978, 7812175; Sweden, Dec. 14, 1978, 7812878**

**Int. Cl.³ E01C *19/38***

**U.S. Cl. 404—114** **4 Claims**



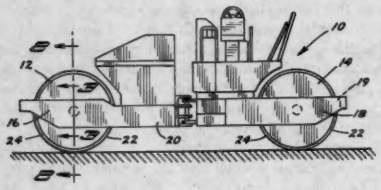
1. An asphalt laying machine with a compacting unit comprising a main section with vibration generating means, and comprising one or more additional sections for variably expanding the working range of the compacting unit, wherein the main section is suspended in vibration isolated manner from a main carrier and each additional section comprises respective vibration generating means and is suspended in a vibration isolated manner from a respective carrier frame, the carrier frame being slidably mounted on the main carrier, and wherein the said sections are connected to the respective carrier means exclusively by vibration dampers comprising vibration dampers on the forward portion of each section, seen in relation to the asphalt laying direction of the machine, the forward vibration dampers being arranged to damp both horizontal and vertical vibration of the associated section and comprising at the rear portion of the section vibration dampers permitting substantially undamped horizontal movements in the longitudinal direction of the machine, but damping vertical vibration of the associated section.

4,313,691

## LUBRICATION AND BEARING STRUCTURE FOR CONCENTRIC, INDEPENDENTLY ROTATING DRUM AND VIBRATORY SHAFT

Zekeriya Yargici, Roseville, Minn., assignor to American Hoist & Derrick Company, St. Paul, Minn.

Filed May 23, 1980, Ser. No. 152,649
Int. Cl.[3] E01C *19/38*
U.S. Cl. 404—117 6 Claims




1. In a surface compacting machine including a main frame having parallel, spaced-apart side frame members, at least one hollow surface contacting drum rotatably mounted on a horizontal axis with the respect to said side frame members of said main frame, at least one shaft rotatably mounted within said drum on said horizontal axis, means to drive said drum at a relatively slow speed over a surface to be compacted, and means to drive said shaft separately from said drum to rotate at a relatively fast speed; the improvement including:

A. at least one drum support assembly fixedly mounted to one of said side frame members, said assembly being provided with a main bearing housing;

B. at least one main drum hub fixedly and concentrically associated with said drum;

C. a main drum support bearing fixedly mounted in said main bearing housing and rotatably supporting said main drum hub for rotation on said horizontal axis;

D. a rotary seal between said main bearing housing and an outer surface of said main bearing hub;

E. said drum support assembly, said rotary seal and a portion of said outer surface of said main bearing hub defining a first oil sump;

F. means to introduce a quantity of lubricating oil into said first sump to depth to immerse a substantial lower portion of the main drum support bearing;

G. a shaft bearing housing at each end of the drum concentrically and fixedly mounted with respect to the drum and in fixed relationship to and in concentric alignment with said main drum hub;

H. a shaft bearing fixedly mounted in each of said shaft bearing housings and rotatably supporting said shaft;

I. a cylindrical second oil sump inside of said drum in concentric relationship with respect to said drum and encompassing said shaft and shaft bearings and in sealing relationship to each of said shaft bearing housings;

J. means to introduce lubricating oil into said second sump; and

K. means to cause oil in said second sump to lubricate said shaft bearings.

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4,313,692

## SEPTIC TANK DRAINAGE CONDUIT STRUCTURES

Wayne D. Johnson, 902 N. 4th, Garden City, Kans. 67846

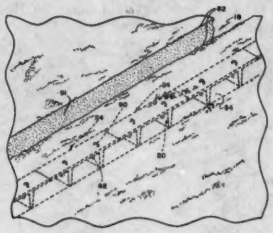
Filed Jan. 28, 1980, Ser. No. 115,693
Int. Cl.[3] E02B *11/00, 13/00*
U.S. Cl. 405—43 3 Claims

1. A conduit structure to be placed in a trench adapted to be connected to a conventional septic tank structure to convey waste water therefrom for absorption into the soil area surrounding said conduit structure, comprising;

(a) said conduit structure having a main body assembly with a top wall member mounted on spaced support leg members;

(b) said support leg members having a drainage hole therein to permit waste water flow therethrough;

(c) said main body assembly having an open area between said support leg members and downwardly of a lower surface of said top wall member to permit free flow of waste water downwardly therefrom into the soil area; and



(d) said support legs extended downwardly and perpendicular to said top wall member and transverse to the longitudinal axis of said top wall member, whereby the waste water can flow freely laterally of said top wall member starting at a position directly below a lower surface of said top wall member into the adjcent soil area which is of a generally solid clay type composition.

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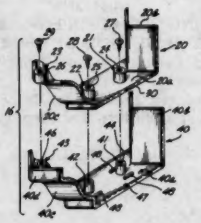
4,313,693

## RAIN GUTTER JOINT

James S. Follows, 12848 Southridge Dr., Surrey, B.C., and Douglas Grant, 540 Newcroft Pl., West Vancouver, B.C., both of Canada

Filed Jan. 16, 1980, Ser. No. 112,625
Int. Cl.[3] E04D *13/00, 13/04*
U.S. Cl. 405—121 10 Claims



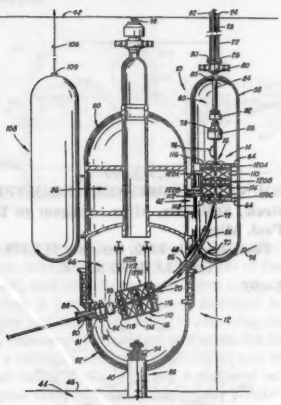
1. A rain gutter joint for connecting a pair of rain gutter troughs that terminate at trough ends adjacent one another, said joint comprising an upper clamping member and a lower clamping member, said upper clamping member having a lower surface cooperably conformable with the upper surfaces of said rain gutter troughs, and said lower clamping member having an upper surface cooperably conformable with the lower surfaces of said troughs, said lower clamping member having a plurality of raised pins extending upwardly from said upper surface of said lower clamping member along a substantially central midline of said lower clamping member, said upper clamping member having a plurality of integral sockets formed to cooperably receive said pins of said lower clamping member, said sockets extending upwardly from said upper clamping member and opening downwardly on said lower surface of said upper clamping member, and fastening means for fastening said pins in said sockets by exerting axial tensile force tending to draw said pins into said sockets.

4,313,694

## SUBMERSIBLE PIPE INSTALLATION SYSTEMS

John W. Cox, Oklahoma City, Okla., assignor to Transworld Drilling Company, Oklahoma City, Okla.

Division of Ser. No. 733,377, Oct. 18, 1976, Pat. No. 4,095,437.
This application Oct. 23, 1979, Ser. No. 86,883
Int. Cl.³ F16L 1/04
U.S. Cl. 405—168 4 Claims



1. A method for installing a pipe between a support structure and a remote second support structure beneath the surface of a body of water, the method comprising the steps of:

passing the pipe through at least one forming assembly disposed in the support structure and forming portions of the pipe in a predetermined radius with each of the forming assemblies;

forming a portion of the pipe with one of the forming assemblies on a radius to provide at least one curved section in the pipe;

passing the pipe between the support structure and the remote second support structure; and

positioning the curved section in the pipe between the support structure and the remote second support structure.

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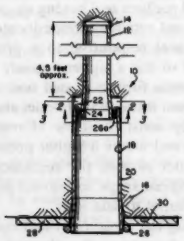
4,313,695

## EARTH STRUCTURE STABILIZING METHOD, AND A FRICTION ROCK STABILIZER AND AN AXIAL EXTENSION THEREFOR

Clifford A. McCartney, Carnegie, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 7, 1980, Ser. No. 110,129
Int. Cl.³ E21D 21/00
U.S. Cl. 405—259 10 Claims



1. A method of stabilizing an earth structure, such as a roof or wall of a mine shaft, or tunnel, and like subterranean openings, comprising the steps of:

forming a plurality of concentric boreholes, of discrete diameters in the earth structure; and

inserting, in each of said boreholes, a friction rock stabilizer comprising a generally tubular body of substantially one cross-sectional configuration along substantially its full length; wherein

said stabilizers inserting step comprises inserting a first friction rock stabilizer in a first of said boreholes of said plurality thereof, and then passing a second friction rock stabilizer through said first stabilizer and inserting said second stabilizer in a second of said boreholes.

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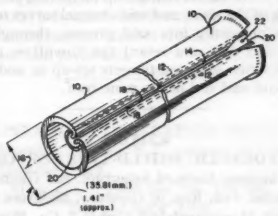
4,313,696

## FRICTION ROCK STABILIZER AND METHOD FOR INSERTION THEREOF IN AN EARTH STRUCTURE BORE

Carl R. Horten, Warren, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Apr. 7, 1980, Ser. No. 138,208
Int. Cl.³ E21D 21/00, 20/00
U.S. Cl. 405—259 5 Claims



1. A method of inserting a radially-contractible, friction rock stabilizer, having a given, relaxed, greatest transverse dimension, into an earth borehole having a diameter of less than said given dimension, for stabilizing the earth, comprising the steps of:

radially contracting the stabilizer to a prescribed transverse dimension which is substantially equal to the borehole diameter; and

forceably inserting the contracted stabilizer into the borehole; and further including the steps of

forming said stabilizer with at least one, substantially annular, relieved land, in the outer surface thereof, which land has a given depth; and

fixing a restraining band in said land, to retain said stabilizer in said prescribed dimension, prior to said inserting step; wherein

said fixing step comprises fixing a band, in said land, which has a thickness of less than said given depth, whereby said band will avoid contact with any surface of the borehole during borehole insertion of the stabilizer.

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4,313,697

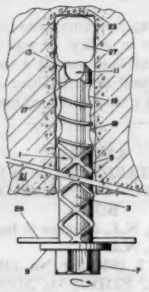
## MINE ROOF SUPPORT PLATE BOLT

Richard C. Rozanc, R.R. #3, McDonald, Pa. 15057

Filed Sep. 17, 1979, Ser. No. 76,506
Int. Cl.³ E21D 20/02
U.S. Cl. 405—261 1 Claim

1. A mine roof support plate bolt for securing an apertured support plate to a mine roof, and designed for use in a preformed hole bored into the mine roof, comprising: a metallic elongated rod having an arcuate surface with irregularities thereon and of a first diameter, with a head and flange at the outer end thereof and an inwardly bevelled inner end having a transverse groove therein, said end having a bevelled surface from said arcuate surface of the rod to the groove, forming

spaced cutting teeth along each side of the groove, and having a helical, counterclockwise, channel formed in the rod, directly communicating with said groove, and extending from said groove along a portion of the rod, the diameter of the rod at the area of the channel being smaller than said first diameter, whereby said cutting teeth effectively shread packages of fast



setting resin constituents that set-up on mixing and effect thorough mixing of the same, and said channel serves to pump resin constituents upwardly into said groove, through clockwise rotation of said rod, and retard the downflow of said resin constituents while said constituents set-up in said rock structure and about said rod in the mine roof.

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**4,313,698**

## HYDRAULIC SHIELD-TYPE SUPPORT

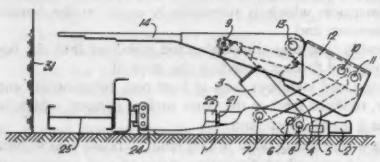
**Alfred Maykemper; Gerhard Schorradt, and Günter Werth, all of Wuppertal, Fed. Rep. of Germany, assignors to Hermann Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany**

**Filed Feb. 6, 1980, Ser. No. 119,186**

**Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2904544**

**Int. Cl.³ E21D *23/00***

**U.S. Cl. 405—296** **4 Claims**



**1.** A hydraulic shield-type mine-roof support comprising a pair of adjacent base slides adapted to slide along the floor of a mine, at least one hydraulic prop pivotally connected at a lower end thereof to said base slides, at least two control levers pivotally connected at lower ends thereof to said base slides, a shield pivotally connected to upper ends of said control levers whereby the shield can be lifted and lowered with respect to said base slides, a mine-roof engaging structure pivotally attached to an upper portion of said shield, a driving ram adapted to act at both ends and disposed between said base slides, means including an inspection platform connected to an extendable part of said ram for the purpose, in operation of the apparatus, of connecting said ram to a conveyor at the working face of a mine, a channel-section guide beam located between said base slides and arranged to support said driving ram, a transverse connecting yoke pivotably interconnecting said base slides at the rear ends thereof to permit relative movement between said base slides both longitudinally and vertically, means connecting an outer cylinder of the driving ram to said guide beam, means coupling said transverse yoke to the rear end portion of said guide beam by at least one substantially vertical pivot pin, and means connecting said extendable part of said ram to an elongate tongue longitudinally guided by said guide beam within the channel thereof, below said driving ram, and connected to said inspection platform.

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**4,313,699**

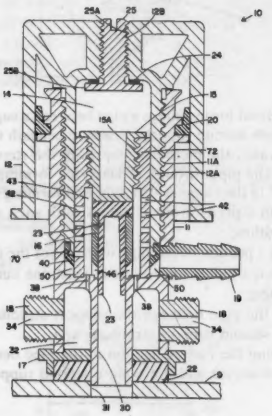
## QUICK MOUNT HIGH PRESSURE BOOSTER VALVES

**James R. Steele, Stillwater, Minn., assignor to Dynamic Air Inc., St. Paul, Minn.**

**Filed Jan. 31, 1980, Ser. No. 117,379**

**Int. Cl.³ B65G *53/58***

**U.S. Cl. 406—93** **7 Claims**



**1.** A booster valve for assisting the flow of material in a conveyor tube with fluid under pressure comprising:

a housing member having an inlet for attachment to a fluid source and an outlet for discharging a fluid into a conveyor tube, said outlet having means for engagement of the exterior of a conveyor tube to thereby discharge fluid into a conveyor tube at a specified location on a conveyor tube;

a cylindrical resilient seal located in said housing member, said cylindrical resilient seal having an exterior, an interior surface and a seal retaining guide located on one of said surfaces, said seal responsive to a pressure differential across said seal so that a higher pressure on said inlet than said outlet permits flexing of said seal to permit flow of fluid past said seal through said outlet and into a conveyor tube to thereby assist the flow of materials through a conveyor tube and where a higher pressure in said outlet than in said inlet permits the resiliency of said seal to return to its original shape to prevent back flow of material from said outlet to said inlet;

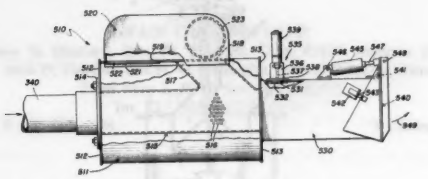
means for relieving the pressure in said booster valve and a removable member to permit replacement of said seal; and

means located on said booster valve to permit quick mounting of said booster valve to a conveyor tube.

## 4,313,700
## FARE COLLECTION SYSTEM AND COMPONENTS THEREOF

**Jim H. Gomez, Kankakee, and Jose E. Davila, Bourbonnais, both of Ill., assignors to Transit Systems Technology, Inc., Kankakee, Ill.**

**Division of Ser. No. 855,970, Nov. 30, 1977, Pat. No. 4,210,801.**
**This application May 14, 1980, Ser. No. 149,844**
**Int. Cl.³ B65G *51/02***
**U.S. Cl. 406—156** **5 Claims**



1. A slowdown mechanism for use in a fare collection system utilizing an air stream to convey the contents of the fare box to a storage vault, said slowdown mechanism comprising a slowdown chamber, a perforated conduit disposed in said slowdown chamber and having an inlet for receiving the air stream carrying the contents of a fare box and an outlet for communication with a storage vault, the longitudinal axis of said perforated conduit being inclined to the horizontal with the inlet disposed higher than the outlet, a paper-air conduit connected to said perforated conduit intermediate the ends thereof and extending upwardly therefrom and outside said slowdown chamber for receiving a portion of the air stream and any paper drawn from the associated fare box, said paper-air conduit including a paper chamber disposed externally of said slowdown chamber, means providing communication between said paper chamber and said slowdown chamber and permitting passage of air therebetween but preventing passage of paper therebetween, a coin collecting chamber at the outlet of said perforated conduit for collecting any coins from the associated fare box, and a door on said collection chamber for permitting discharge of the coins therefrom into the associated storage vault.

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## 4,313,701
## REMOVABLE CONTAINER GIMBALS MOUNTING ON A TRANSPORTING CAR CONTAINER

**Gerhard Brust, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

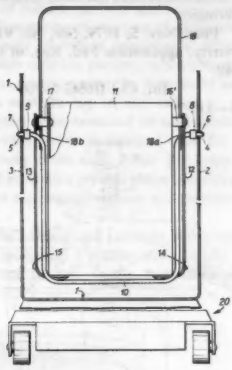
**Filed Aug. 6, 1979, Ser. No. 63,935**
**Claims priority, application Fed. Rep. of Germany, Aug. 10, 1978, 7824049[U]**
**Int. Cl.³ B60P *1/64*; B65J *1/20, 1/22, 1/02***
**U.S. Cl. 410—52** **7 Claims**

1. A transport car assembly comprising a transport car container (1) having two limiting walls (2, 3) lying opposite one another, a removable container insert (11) disposed within said car container (1) and between said two limiting walls,

said two limiting walls (2, 3) having respective recesses (4, 5) which are aligned with each other for defining a pivot axis,

a U-shaped support bracket (10) supporting the container insert (11) and having respective arms with outwardly bent end areas providing respective pivot pins (6, 7) inserted into the respective recesses (4, 5) so that the U-shaped support bracket (10) and the container insert (11) supported thereby are pivotally mounted within said car container (1) by means of said pivot pins (6, 7) for pivotal movement about said pivot axis relative to said car container (1),

said container insert (11) having side members (14, 15) disposed parallel to said limiting walls (2, 3), and said side members (14, 15) having respective slots (12, 13) receiving the respective arms of said U-shaped support bracket (10) for releasably interengaging the container insert (11) with



the U-shaped support bracket (10) so as to provide for joint pivotal movement relative to said car container (1) of the U-shaped support bracket (10) and the container insert (11) about said pivot axis.

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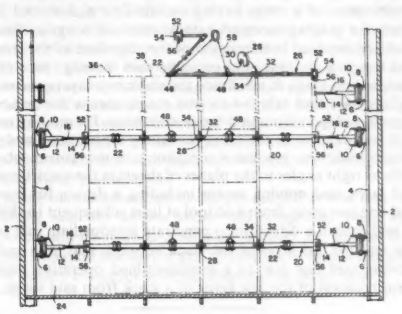
## 4,313,702
## CONTAINER CONSTRAINER SYSTEM

**John M. DiMartino, Sayville, N.Y., assignor to Line Fast Corporation, Holbrook, N.Y.**

**Filed Jan. 7, 1980, Ser. No. 109,786**
**Int. Cl.³ B60P *3/06***
**U.S. Cl. 410—94** **8 Claims**



1. A constrainer for shipping containers for maintaining container position with respect to the walls of a vessel, said vessel having at least two walls in opposition to each other comprising:

(a) first mounting means affixed to a first wall of the vessel;

(b) second mounting means affixed to a second wall of the vessel, said second wall of the vessel being in opposition to said first wall of the vessel;

(c) linear bridge means connectable to both the first mounting means and the second mounting means capable of running adjacent to a first side wall of a shipping container located in said vessel;

(d) a plurality of chock means mounted on said bridge means capable of encompassing a portion of a second and a portion of a third side wall of the container to constrain lateral motion of the container with respect to the linear alignment of the bridge means.

## 4,313,703
## APPARATUS FOR BREAKING UP STACKS OF PAPER SHEETS OR THE LIKE

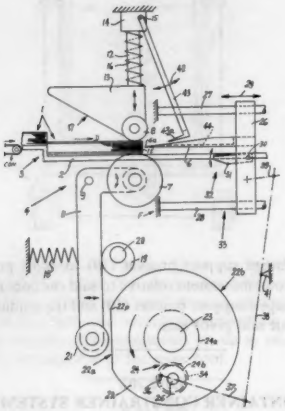
**Paul Fabrig, Neuffen, Fed. Rep. of Germany, assignor to Womako Maschinenkonstruktionen GmbH, Nürtingen, Fed. Rep. of Germany**

**Filed Nov. 5, 1979, Ser. No. 91,080**

**Claims priority, application Fed. Rep. of Germany, Nov. 17, 1978, 2849949**

**Int. Cl.³ B65G *59/06***

**U.S. Cl. 414—115** **17 Claims**



**1.** In an apparatus for dividing stacks of overlapping sheets into a plurality of layers including a last layer and a preceding layer and wherein each stack includes an edge face extending substantially at right angles to the planes of the sheets, the combination of a tongs having mobile first and second jaws; means for guiding successive stacks into said tongs so that the jaws are disposed in the region of the edge face of the stack in said tongs; a dividing tool movable into the edge face of the stack in said tongs to subdivide the stack into layers; means for shifting said tool relative to said tongs; means for removing successive layers from said tongs; and means for moving one of said jaws relative to the other jaw along a predetermined path wherein said one jaw has a component of movement substantially at right angles to the planes of sheets in the stack between said jaws, said moving means including a device for moving said one jaw away from said tool at least subsequent to shifting of said tool in a direction to penetrate intermediate said other jaw and the last layer of the stack between said jaws and for moving said one jaw to a predetermined operative position upon removal of the last layer of a stack from said tongs.

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## 4,313,704
## GAS-TIGHT CLOSURE

**Werner Kucharzyk, Essen, and Wolfgang Rohde, Essen-Heisingen, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH and Didier Engineering GmbH, both of Essen, Fed. Rep. of Germany**

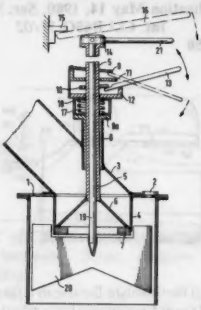
**Filed Apr. 23, 1979, Ser. No. 32,495**

**Claims priority, application Fed. Rep. of Germany, Apr. 22, 1978, 2817736**

**Int. Cl.³ C10J *3/50***

**U.S. Cl. 414—199** **12 Claims**

**1.** A gas-tight closure for a feeding pipe having an outlet communicating with a filling space, comprising a thin-walled tubular extension projecting from said outlet into said space and having a yieldingly deformable cylindrical free end portion; and sealing means, including a frusto-conical sealing member having a bottom base slightly smaller than the inner radial cross-section of said extension and, connected to said bottom base, a plug-like sealing part defining an upper end and a lower end, the outer surface of said sealing part being slightly inwardly inclined toward said free end so that the radial cross-section of its upper end is slightly smaller and the radial cross-section of its lower end is slightly greater than said inner radial cross-section; and an actuating rod connected to said sealing



member and projecting through said extension to the outside of said pipe, said actuating rod being movable between an open position in which said sealing member is spaced from said free end portion and a sealing position in which said sealing member is drawn into said extension and said peripheral edge face yieldingly deforms said cylindrical free end portion to form a seal therewith.

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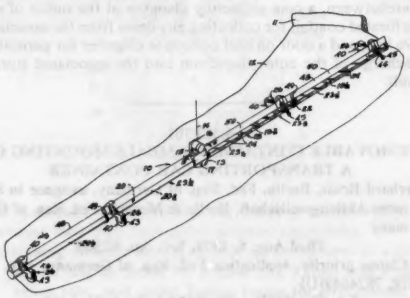
## 4,313,705
## UNLOADER FOR STORAGE BINS

**William J. Jackson, P.O. Box 266, Mendota, Ill. 61342**

**Filed Jan. 26, 1979, Ser. No. 6,765**

**Int. Cl.³ B65G *65/46***

**U.S. Cl. 414—312** **9 Claims**



**1.** A device for unloading particulate material from a pile in a circular storage bin to a central outlet sump in a floor of the bin beneath the pile, comprising:

a first auger extending radially outwardly from a central vertical axis for rotation about a first auger axis;

a second auger extending radially outward from the vertical axis in diametric opposition to the first auger for rotation about a second auger axis;

a central counter rotating auger drive means operatively connecting the first and second augers adjacent the vertical axis for axially aligning the first and second augers to diametrically opposed relationship with the first and second auger axes being coaxial and for rotating the augers in opposite rotational directions;

pivot drive means for pivoting the diametrically opposed first and second augers in a forward direction about the vertical axis;

wherein the central counter rotating auger drive means includes;

a worm wheel on each auger adjacent the vertical axis;

a worm gear in meshing engagement with each worm wheel;

a single drive shaft;

means interconnecting the single drive shaft and worm gears for turning the worm wheels in opposite directions in response to turning motion of the drive shaft; and

central power means for turning the single drive shaft.

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**4,313,706**

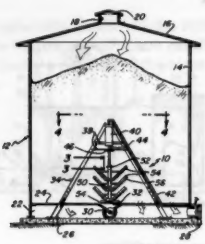
## GRAIN CAKE BREAKER

**Jack D. Danford, Box 98, Watkins, Colo. 80137, assignor to Jack D. Danford and H. H. Champlin, both of Watkins, Colo.**

**Filed May 2, 1980, Ser. No. 145,972**

**Int. Cl.³ B65G *65/00, 3/00***

**U.S. Cl. 414—326** **9 Claims**



**1.** An apparatus for breaking up grain cake in a grain storage bin of the type including a housing, a base floor, a bin floor for supporting grain in the bin spaced above the base floor, a conveyor located between the base floor and the bin floor extending across the bin and through the housing for discharging grain from the bin, and at least one opening in the bin floor above the conveyor through which grain from the bin is fed to the conveyor, said apparatus including:

a support structure positioned within the storage bin;

hydraulic means mounted on said support structure;

a shaft coupled to said hydraulic means so that, upon activation of said hydraulic means, said shaft reciprocally moves in a substantially vertical direction; and

a plurality of rigid cutting arms connected along said shaft, said cutting arms extending outwardly from said shaft to reciprocally move with said shaft for loosening grain cakes that form above the opening in the bin floor so that a continuous flow of grain to the conveyor is provided.

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**4,313,707**

## SIDE LOADING APPARATUS FOR TRASH COLLECTION SYSTEM

**John W. Bingman, 1714 E. Gary, Mesa, Ariz. 85203, and Julius A. Barker, Jr., 2501 N. 69th St., Scottsdale, Ariz. 85257**

**Continuation-in-part of Ser. No. 762,412, Jan. 25, 1977, abandoned. This application Jan. 29, 1979, Ser. No. 7,398**

**Int. Cl.³ B65B *21/02***

**U.S. Cl. 414—409** **2 Claims**

**1.** In a trash collection system for loading trash into the truck body of a side loading trash collection vehicle, the improvements comprising:

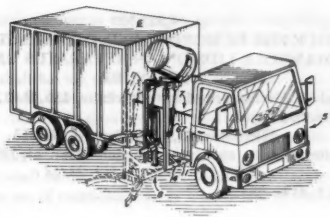
a. a frame member extendably secured to said truck body for horizontal movement away from and toward said truck body;

b. a pair of guide rails, parallel to each other, mounted on said frame member and extending substantially vertically upwardly therefrom along side said truck body, said guide rails movable with said frame member toward and away from said truck body; each of said guide rails having a top section hingedly secured to the remainder of said rail for tilting movement about a horizontal hinge axis;

c. a carriage having a lower pair of rollers mounted for rotation about a common horizontal axis of rotation and an upper pair of rollers, each of said lower pair of rollers engaging a different one of said pair of guide rails and each of said upper pair of rollers engaging a different one of said pair of guide rails for guiding said carriage along said rails from a rest position near the bottom of said rails to a dump position near the top of said rails;

d. a pair of gripping arms mounted on said carriage, each of said arms pivotal about a vertical axis for movement toward and away from each other for gripping a trash container, said arms also pivotal about a horizontal axis for movement into a stowing position in a substantially vertical plane;

e. lifting means for raising said carriage along said rails, said lifting means including a piston and cylinder secured at one end thereof to said frame member and having a



sprocket secured to the other end, a chain secured at one end thereof to said frame member, said chain passing over said sprocket and secured at its other end to said carriage about a horizontal pivot axis to permit pivotal movement of said carriage with respect to said chain about said horizontal pivot axis, said horizontal pivot axis being coincident with said common horizontal axis of rotation;

f. stop means secured to at least one of said guide rails below the top section thereof, and positioned to contact said carriage to stop said carriage with said common horizontal axis of rotation coincident with said horizontal hinge axis, whereby said horizontal hinge axis, said common horizontal axis of rotation, and said horizontal pivot axis are all coincident with each other when said carriage is in said dump position; and

g. tilting means connected to the top section of said rails for tilting said top section about said horizontal hinge axis when said carriage is positioned on said top section and said common horizontal axis of rotation of said lower pair of rollers coincides with said horizontal hinge axis.

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**4,313,708**

## PORTABLE LIFTING AND DELIVERING APPARATUS FOR BIN CONTAINERS

**Mike J. Tiliakos, 291 Twelfth St., Campbell, Ohio 44405**

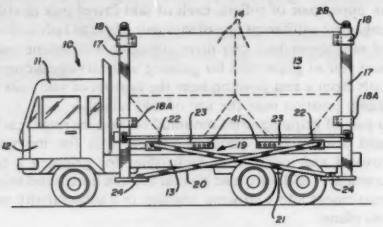
**Filed Jun. 13, 1980, Ser. No. 159,302**

**Int. Cl.³ B60P *1/54***

**U.S. Cl. 414—498** **4 Claims**

**1.** A portable container having at least one bin therein, means for elevating said container relative to a supporting surface, said container having four right angular vertical walls joined by inwardly extending right angular corner configurations defining vertical paths, said means for elevating said container comprising four posts, each having a cross sectionally I-beam configuration, said posts disposed in said inwardly extending corner configurations, L-shaped post guides on said vertical walls partially enclosing said inwardly extending corner configurations to that said posts may move vertically on said paths, horizontally disposed rotatable shafts extending between said posts, pulleys on said posts and cables attached to

said post guides and trained over said pulleys and engaged on said shafts, means for rotating said shafts simultaneously so as



to move said cables and said container and said posts relative to one another.

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**4,313,709**

## DEVICE FOR REMOVING AND/OR RE-INSTALLING MANHOLE LIDS ON AN APPARATUS UNDER PRESSURE

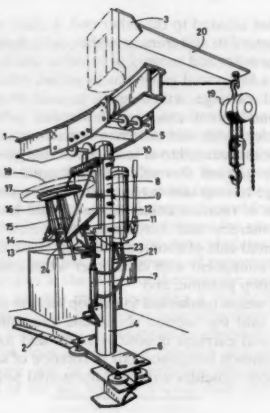
**Michel M. Herman, rue Haute-Rochette, 116, B.4120 Flemalle (Ramet), Belgium**

**Filed Mar. 23, 1979, Ser. No. 23,313**

**Claims priority, application Belgium, Mar. 23, 1978, 646405**

**Int. Cl.³ B66C *11/12, 23/18***

**U.S. Cl. 414—684.3** **2 Claims**



1. A device for removing and re-installing manhole lids in an apparatus under pressure, comprising:

guide means extending about at least a portion of the periphery of said apparatus;

carriage means movable along the guide means;

vertical column means mounted on said carriage means for rotation about a vertical axis with respect to said carriage means;

rack means vertically slidably mounted on said column means;

support means hingedly mounted on said rack means for pivoting relative to said rack means in a plane containing the rotation axis of the column means, said support means comprising a first supporting plate extending in a plane inclined at an acute angle to the rotation axis of said column means;

supporting table means slidably mounted on said first supporting plate for translation movement in a direction inclined at an angle to the axis of said column means;

first driving means for moving the rack means along said column means;

second driving means for pivoting the column means about said axis;

third driving means for pivoting said support means relative to the rack means in said plane; and

fourth driving means for displacing said supporting table means with respect to said first supporting plate.

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**4,313,710**

## WIND MOTOR

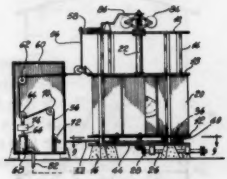
**Romeo La Ferte, 3905 Beethoven St., Ville Brossard, Province of Quebec, Canada J4Z 2W5**

**Filed Aug. 28, 1980, Ser. No. 182,460**

**Claims priority, application Canada, May 26, 1980, 352691**

**Int. Cl.³ F03D *7/06***

**U.S. Cl. 415—2 R** **2 Claims**



1. A wind motor comprising:

(a) a stator including imperforate top and bottom horizontal discs spacedly mounted on upstanding posts, an intermediate annular disc parallel to the top and bottom discs and also secured to said posts, and a plurality of directing blades pivotally mounted between said intermediate and bottom discs, said top and intermediate discs defining a space there between which is open to the exterior completely around said discs;

(b) a rotor having a vertical shaft journalled at the center of said top and bottom discs and vertical blades secured to said shaft and extending radially towards the blades of the stator, whereby the wind is directed by the stator blades onto the rotor blades and ejected through the central opening in the intermediate disc and the space between the top and intermediate discs, said annular disc defining a central circular opening which is coaxial with said shaft and which has a diamater substantially equal to the rotor diamater; and

(c) means for automatically varying the angular position of the stator blades between open and closed positions, so as to control the speed of the rotor; so arranged that the wind passing directly between said top and intermediate discs assists the ejection of the air from the rotor, and closing of the stator blades creates a suction of the trailing surface of the rotor blades, thus helping in retarding the rotor.

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**4,313,711**

## TURBINE AND LIKE ROTARY MACHINES

**Alan S. Lee, Leicester, England, assignor to The English Electric Company Limited, London, England**

**Filed Aug. 22, 1978, Ser. No. 935,789**

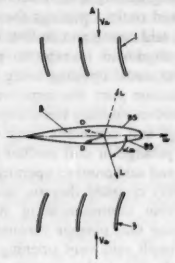
**Claims priority, application United Kingdom, Aug. 24, 1977, 35468/77**

**Int. Cl.³ F03B *13/12, 3/04, 3/12***

**U.S. Cl. 415—7** **15 Claims**

1. A water turbine comprising a rotor for mounting below the surface of an expanse of water, and incorporating a plurality of generally radially extending rotor blades fixed in position relative to the rotor wherein each rotor blade is substantially

symmetrical about a plane perpendicular to the rotor axis, and wherein the blades have surfaces which are of generally aerofoil shape and are mounted with their leading edges facing in the same circumferential direction, such that a flow of water



past the blades generally parallel to the rotor axis produces a movement of the blades in a direction parallel to said plane of symmetry, and hence a rotation of the rotor in said circumferential direction.

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**4,313,712**

## MOUNTING OF ROTOR ASSEMBLIES

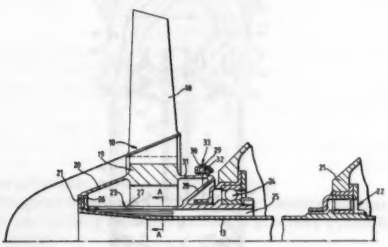
**Henry R. Briggs, Bristol, England, assignor to Rolls-Royce Limited, London, England**

**Filed Feb. 19, 1980, Ser. No. 122,700**

**Claims priority, application United Kingdom, Mar. 17, 1979, 09460/79**

**Int. Cl.³ F01D** *5/02*

**U.S. Cl. 416—2** **6 Claims**



1. A rotor assembly comprising, a drive shaft mounted in a first bearing means at a location spaced from a first end of the shaft, and supported at the first end by a support means which is more flexible in bending and in torsion than the drive shaft, the support means being mounted for rotation in a second bearing means co-axial with the first bearing means, a rotor connected to the first end of the drive shaft to be driven thereby, the rotor being supported in the second bearing means through a frangible coupling designed to break the connection between the rotor and the second bearing means only when the rotor is subjected to a predetermined out-of-balance load to allow the rotor and drive shaft to run inverted, and the rotor is connected to a first part of the frangible coupling and a second part of the frangible coupling is supported for rotation in the second bearing means.

**4,313,713**

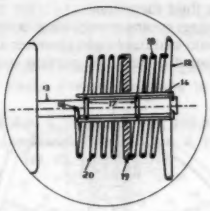
## APPARATUS FOR IMPROVING THE PERFORMANCE OF A ROTATIONAL WIND ENERGY CONVERSION SYSTEM

**Lambros Lois, 6104 Dunleer Ct., Bethesda, Md. 20034**

**Filed Jul. 2, 1980, Ser. No. 165,473**

**Int. Cl.³ F03D** *11/02*

**U.S. Cl. 416—135** **10 Claims**



1. A rotational energy conversion system comprising,
a wind drivable blade which rotates in response to wind forces,
a rotor shaft having one end connected to said wind driven blade, such that under the influence of wind forces, the blade rotation is about an axis coinciding with said rotor shaft, causing said rotor shaft to rotate in the same direction, and
a driven shaft connectable at one end to an end device which makes use of rotational energy transmitted by said driven shaft,
said rotor and driven shafts, at their other ends, being attached to one another by a coil spring and mass element system, such that, under the influence of wind forces, said driven shaft will be caused to rotate in the same direction as said rotor shaft,
said coil spring and mass element system comprising,
a series of at least two coil springs, the first and last of which are terminal springs, each adjacent pair separated from each other by and connected to opposite sides of a generally circular wheel-shaped mass element which is not attached to the rotor or driven shafts, the ends of the terminal springs which are not attached to one of said masses, being attached one to said rotor shaft and the other to said driven shaft, the configuration of said springs being such that they wind up in response to the normal rotational motion of said rotor shaft in response to wind forces.

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**4,313,714**

## HIGH PRESSURE RADIAL PUMP

**Johnny D. Kubeczka, 6002 Viking, Houston, Tex. 77092**

**Filed Oct. 1, 1979, Ser. No. 80,933**

**Int. Cl.³ F04B** *1/18*

**U.S. Cl. 417—273** **5 Claims**

1. A high pressure rotary pump comprising
housing means including a central chamber portion comprising a fluid-tight chamber substantially filled with lubricating oil and a plurality of hollow portions extending radially outward therefrom,
said radially extending portions each including means forming a pumping cylinder having an inlet and an outlet for pumping liquid therethrough,
a plurality of pump piston means, each comprising a cross head drive portion and a separate pump piston removably secured thereon guided in one of said hollow portions and extending into one of said pumping cylinders,
said cross head pistons each having a T-slot therein,
said pump pistons each being a rod with a slotted end portion of a size and shape removably secured to said cross

head piston by insertion in said T-slot in one direction followed by 90° rotation thereof,

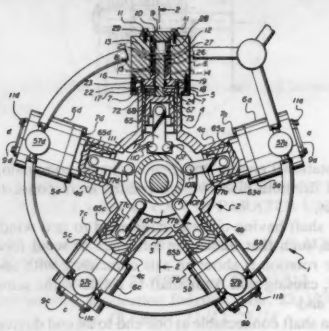
said cross head pistons each having apertures permitting flow of oil through the end wall thereof,

said pumping cylinders each including sealing means surrounding the respective pump pistons to seal against lubricating oil entering therein,

a first conduit means interconnecting said inlets for conducting fluid thereto,

a second conduit means interconnecting said outlets for conducting fluid therefrom,

rotary operating means comprising a rotary drive shaft extending into said fluid-tight chamber and having a cylindrically shaped offset cam portion and a ring member



surrounding the same for operation thereby supported for rotation in said chamber,

connecting means comprising a plurality of connecting rod members each connected at one end to said ring member and at the other end to one of said pump piston means for moving the same reciprocally and sequentially into and out of said hollow portions and said pumping cylinders,

one of said connecting rod members being connected to said ring member by a non-pivotal connection,

all of the other connecting rod members being connected to said ring member by pivotal connections, and

all of said connecting rods being connected to respective ones of said cross head drive pistons by pivotal connections.

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**4,313,715**

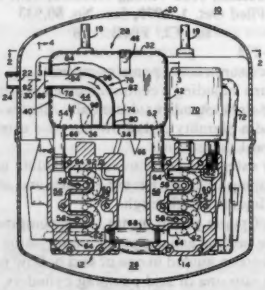
**ANTI-SLUG SUCTION MUFFLER FOR HERMETIC REFRIGERATION COMPRESSOR**

**Hubert Richardson, Jr., Brooklyn, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.**

**Filed Dec. 21, 1979, Ser. No. 106,287**

**Int. Cl.³ F04B *39/16***

**U.S. Cl. 417—312** **10 Claims**



**1.** In a hermetic refrigeration motor-compressor assembly including a motor driving a compressor having suction and discharge ports, a hermetically sealed casing enclosing said motor and compressor and having a gas inlet opening and a sump therein, a discharge conduit coupled to said compressor discharge port and extending out of said casing, and a suction muffler in said casing having a wall defining a chamber, said wall having inlet and outlet openings therein communicating with said chamber, said casing and muffler inlet openings being in closely-spaced alignment thereby to provide semi-direct suction, said muffler outlet opening being directly coupled to said compressor suction port: the improvement wherein said muffler wall has another opening therein spaced from said inlet and outlet openings and communicating with said chamber, and comprising a passage in said muffler chamber extending between said inlet and said another openings and having opposite ends respectively coupled thereto, said passage having a vent opening therein communicating with said chamber, whereby gas entering said passage through said muffler inlet opening flows through said vent opening into said chamber and thence through said outlet opening to said compressor suction port whereas, a slug of liquid refrigerant flows throuh said passage and out of said another opening to said sump.

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**4,313,716**

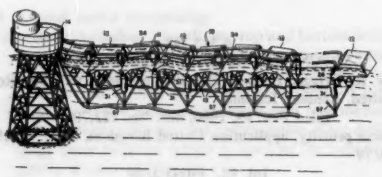
**ARTICULATED, ENERGY CONVERTING STRUCTURE**

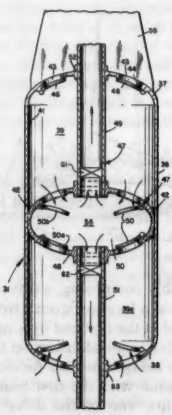
**Asberry B. Jones, Slidell, La., assignor to Texaco Inc., White Plains, N.Y.**

**Filed May 10, 1979, Ser. No. 37,619**

**Int. Cl.³ F04B *17/00;* E02B *9/08***

**U.S. Cl. 417—331** **2 Claims**





**1.** In combination with a wave articulated facility adapted to be floatably positioned in a body of water and having at least two adjacently positioned rafts which are hinged along a common pivot edge to permit independent movement of each raft about said pivot edge in response to wave movement beneath the facility, and flow conduit means carried on the facility to conduct pumped water therethrough,

a double acting pump operably carried on said facility and comprising an elongated casing having opposed end walls, one end thereof being pivotally engaged with the respective adjacently positioned rafts at said pivot edge, and said casing being communicated with said body of water through check valve means formed at opposite ends of said casing to permit entry of water into the casing,

a double ended piston disposed within said elongated casing having a valved plunger in slidable registry with the casing inner wall, which valved plunger includes an inner compartment,

check valves at opposed longitudinal ends of said plunger, being operable to open into said compartment whereby to admit water to said inner compartment when the plunger is reciprocated,

a pair of hollow shafts defining flow passages, and disposed coaxially with said casing and with each other, each being suitably registered at the casing ends to permit reciprocatory movement of the piston through the casing,

said respective hollow shafts having an inner end thereof connected to said valved plunger, and being in communication with the inner compartment thereof,

check valve means in the respective shafts being operable to permit a unidirectional flow of water from said inner compartment into the respective hollow shafts and the latter being communicated with said flow conduit means on said facility to direct flows of water therethrough,

whereby relative movement between adjacently positioned hinged rafts will cause reciprocal movement of said double ended piston through the pump casing and urge a flow of water through the respective flow conduits.

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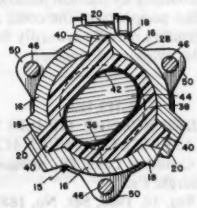
**4,313,717**

## ADJUSTABLE PRESSURE EXTRUSION PUMP

**Eugene F. Kopecky, 5959 Madra Ave., San Diego, Calif. 92120**

**Filed Oct. 4, 1979, Ser. No. 81,836**
**Int. Cl.³ F04C *2/00, 5/00***
**U.S. Cl. 418—48** **3 Claims**



1. An adjustable cavity pump comprising:

an elongated housing consisting of three identical elongated arcuate housing segments defining a generally cylindrical chamber;

said segments each include a stub flange extending outward from the outer surface and extending along one longitudinal edge and a cap flange spaced outward from the outer surface and extending along the other longitudinal edge, the stub and cap flanges on the adjacent segments cooperatively engaging with the cap flange overlapping the stub flange for defining an adjustable width longitudinal groove tapering outwardly on both sides of the groove to a narrower width at the juncture of the flanges of adjacent housing segments and having a depth exceeding the thickness of said segment extending the length of the cylindrical cavity and for guiding said housing segments radially inwardly and outwardly,

an elongated elastomeric stator having a helical bore for receiving a helical rotor and detachably mounted in said chamber, and including a plurality of radially extending lugs having a radial dimension of about the minimum thickness of said stator engaging said grooves for preventing rotation of the stator and for transferring circumferential displacement of said flanges to radial displacement of said lugs inwardly, and

said housing including band clamp adjusting means for adjusting said housing segments radially inwardly and outwardly for adjusting the diameter of said helical bore.

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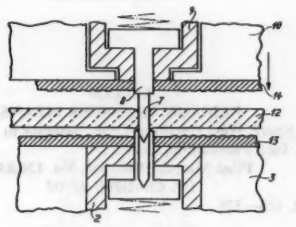
**4,313,718**

## METHOD FOR THE MANUFACTURE OF FLEXIBLE DISKS AND APPARATUS FOR PERFORMING THIS METHOD

**Raymond Llabres; Robert Antoine; Jean P. Lacotte, and Charles Marchi, all of Paris, France, assignors to Thomson-CSF, Paris, France**

**Filed Jan. 2, 1980, Ser. No. 109,041**
**Claims priority, application France, Jan. 4, 1979, 79 00199**
**Int. Cl.³ B29D *17/00***
**U.S. Cl. 425—290** **3 Claims**



1. An apparatus for manufacturing flexible disks having a compression press with a fixed plate and a moving plate, a punch of diameter $d_1$ provided with a base of diameter $d_2 > d_1$ forming a centering means, $d_1$ being the diameter of a preliminary hole and $d_2$ the diameter of a central hole to be cut in the disks, said punch being able to slide in a sleeve provided for this purpose in one of said plates, a second punch of diameter $d_2$ having a funnel-shaped hole whose bottom has a diameter $d_1$ is accurately adapted to the first punch, said second punch being able to slide in a sleeve provided for this purpose in the other of said plates, the sleeve located in the upper plate being movable therein so as to permit the guidance of the first punch in the second punch, the apparatus also having means for applying a force which is at least equal to the force necessary for making said preliminary hole with said first punch and a force which is at least equal to that necessary for making said central hole with said second punch.

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**4,313,719**

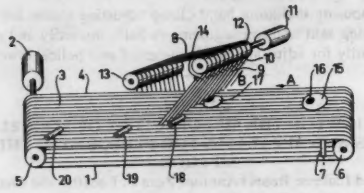
## DEVICE FOR ROLLING UP PIECES OF MATERIAL

**Bror F. Lundgren, Bjuy, Sweden, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland**

**Filed Feb. 20, 1981, Ser. No. 236,172**
**Claims priority, application Sweden, Mar. 6, 1980, 8001770**
**Int. Cl.³ B29C *17/00;* B29D *3/00***
**U.S. Cl. 425—335** **8 Claims**

1. A machine for rolling pieces of soft material in leaf form, comprising a plurality of endless belts, each belt being formed by a plurality of endless elements spaced apart from one another and running parallel to the direction of movement of the belt, the plurality of endless belts being made up of a first belt moving substantially in a horizontal plane and at least one second belt moving in an oblique plane relative to the plane of the first belt so that it crosses the first belt by passage of its elements through the spaces between the elements of the first belt along a line of intersection which forms an acute angle with the direction of movement of the first belt, the first belt

forming an obtuse angle with the second belt, as measured in a plane perpendicular to their line of intersection, the direction



of movement of the second belt forming an acute angle with the line of intersection of the two belts.

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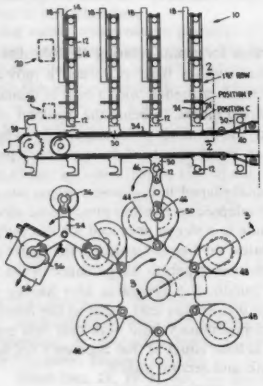
**4,313,720**

## PARISON TRANSFER MEANS

**Robert Spurr, West Hartford, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.**

**Filed Mar. 3, 1980, Ser. No. 126,834**
**Int. Cl.³ B29C *17/07***
**U.S. Cl. 425—526** **7 Claims**



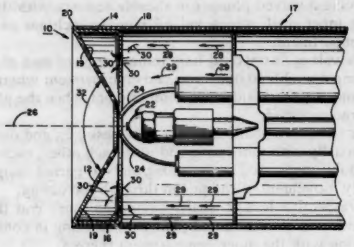
1. In a machine system for manufacturing plastic bottles comprising a plurality of parison-forming stations, a plurality of blowing stations fewer in number than the number of parison-forming stations, a storage station for holding parisons formed at said parison-forming stations, and means for transferring parisons from said parison-forming stations to said storage station and from said storage station to said blowing stations; the improvement wherein the storage station includes support means for receiving a plurality of parisons X from said parison-forming stations, and the transfer means from said storage station to said blowing stations include shuttle means for sequentially transferring from said support means a plurality of parisons Y, which plurality is fewer in number than said plurality of parisons X to a station intermediate of said support means and said blowing stations, and conveyor means for simultaneously receiving said plurality of parisons Y from said intermediate station and continuously transferring said plurality of parisons Y individually and sequentially from said intermediate station to said blowing stations.

**4,313,721**

## OIL BURNER DIFFUSER

**Joseph Henriques, 32 Hidden Brook Dr., Brookfield, Conn. 06804**

**Filed Mar. 15, 1979, Ser. No. 20,932**
**Int. Cl.³ F23Q *3/00***
**U.S. Cl. 431—265** **24 Claims**



1. An oil burner diffuser for increasing the combustion efficiency in a gun-type oil burner having a fuel injector nozzle for discharging a conically-shaped fuel spray pattern centrally about a central blast tube and means for supplying pressurized air to the blast tube, wherein the improved combustion efficiency is obtained with a minimal amount of excess air and with negligible carbon buildup on the diffuser and associated oil burner components, wherein the diffuser comprises:

(A) a cone having a central opening at its upstream end axially positionable with the oil burner nozzle, and holes positioned in radially extending circles about this central opening, with the hole to non-hole surface area ratio for these circles decreasing from a maximum near the cone central opening to a minimum near the downstream end of the cone and then increasing, at the extreme downstream end thereof, to a value intermediate the maximum and minimum values;

(B) a rearwardly extending cylindrical member attached to the outer, downstream periphery of the cone; and

(C) a back ring extending radially inwardly from the rearward termination of the cylindrical member.

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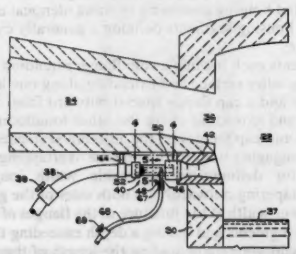
**4,313,722**

## FLUID SHIELDED BURNER TIP FOR USE WITH A GLASS MELTING FURNACE

**Jeffrey S. Yigdall, Conneaut Lake, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Sep. 18, 1980, Ser. No. 188,430**
**Int. Cl.³ F27D *17/00*; B05B *15/00*; F23D *11/36*; F23C *5/08***
**U.S. Cl. 432—1** **12 Claims**



8. A method of heating the interior of a chamber, the interior of said chamber defined by the interior surfaces of wall portions and port walls communicating with said wall portions, said port walls defining ports for passing combustion air into said chamber during a firing cycle and passing combustion

products out of said chamber during an off-firing cycle, said chamber including at least one fuel input passageway formed in said wall portions or said port walls and extending between the interior and the exterior of said chamber, comprising the steps of:

mounting a burner tip spaced from the interior of said chamber, said burner tip having an inlet end, an outlet end adjacent said fuel input passageway of said chamber, and a fuel passage between said inlet end and said outlet end;

directing fuel along said fuel passage of said burner tip into said fuel input passageway of said chamber and therethrough into the interior of said chamber during said firing cycle;

discontinuing said fuel directing step at the end of said firing cycle; and

passing a cooling fluid through said burner tip along a discrete cooling fluid passage therein toward the fuel input passageway of said chamber during said off-firing cycle to shield said burner tip from corrosive combustion products which tend to escape the interior of said chamber through said fuel input passageway during said off-firing cycle.

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**4,313,723**

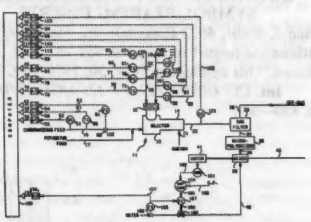
## APPARATUS FOR PRODUCING CARBON BLACK

**Robert H. Kallenberger, Bartlesville, Okla., and John E. Anderson, Corpus Christi, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 19,948, Mar. 12, 1979, Pat. No. 4,259,308. This application Nov. 6, 1980, Ser. No. 204,664**

**Int. Cl.³ F27B** *9/40;* **F27D** *19/00;* **F26B** *19/00*

**U.S. Cl. 432—37** **8 Claims**



1. Apparatus comprising:

a carbon black dryer means;

means for supplying wet carbon black to said carbon black dryer means;

means for removing dried carbon black from said carbon black dryer means;

a furnace means;

means for supplying fuel to said furnace means;

means for supplying heat from said furnace means to said carbon black dryer means;

means for establishing a first signal representative of the heat required per unit time to produce said dried carbon black at a desired temperature;

means for establishing a second signal representative of the efficiency of said carbon black dryer means;

means, responsive to said first signal and said second signal, for establishing a third signal representative of the heat which must be supplied per unit time from said furnace means to said carbon black dryer means to produce said dried carbon black at the desired temperature;

means for establishing a fourth signal representative of the heat, per unit of said fuel, which is given up in said carbon black dryer means;

means, responsive to said third signal and said fourth signal, for establishing a fifth signal representative of the flow rate of said fuel to said furnace means required to produce said dried carbon black at the desired temperature; and

means for manipulating the flow rate of said fuel in response to said fifth signal.

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**4,313,724**

## CERAMIC BURNER FOR USE IN AN AIR HEATER

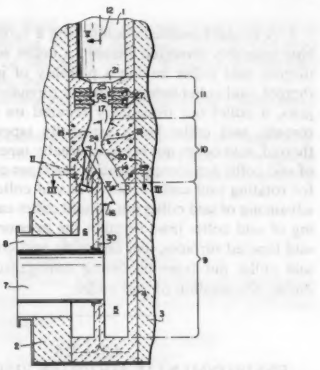
**Rudolf Müller, Merzenich; Hans Kuckertz, and Erich Marx, both of Düren, all of Fed. Rep. of Germany, assignors to Hermann Rappold & Co. GmbH, Düren, Fed. Rep. of Germany**

**Filed Jan. 11, 1980, Ser. No. 111,302**

**Claims priority, application Fed. Rep. of Germany, Jan. 27, 1979, 2903147**

**Int. Cl.³ F28C** *3/10*

**U.S. Cl. 432—217** **9 Claims**



1. In a ceramic burner for use in an air heater of the type including an axially extending combustion chamber, said burner including a mouth portion adapted to open into the combustion chamber of the air heater, a fuel gas supply conduit having a gas delivery region opening into said mouth portion and a mixing and aspiration region communicating with said gas delivery region and adapted to extend in a direction inclined with respect to the axis of the combustion chamber of the air heater, and an air supply conduit having nozzles opening into said mixing and aspiration region of said fuel gas supply conduit, the improvement wherein:

said mixing and aspiration region of said fuel gas supply conduit has an angular configuration including a first segment inclined with respect to the axis of the combustion chamber in a direction toward said nozzles of said air supply conduit and a second segment inclined with respect to said first segment and in communication therewith at a position of directional change;

said gas delivery region of said fuel gas supply conduit is in communication with said second segment of said mixing and aspiration region and is adapted to extend coaxially with respect to the combustion chamber of the air heater;

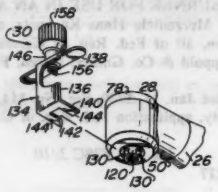
said nozzles of said air supply conduit comprise a first set of nozzles and a second set of nozzles, said first set of nozzles being directed toward an opposite wall of said first segment of said mixing and aspiration region adjacent said position of directional change, and said second set of nozzles being directed toward said mouth portion; and

said gas delivery region having extending thereinto, at positions adjacent said mouth portion, a plurality of projections.

## 4,313,725
## DENTAL HANDPIECE AND COLLET WRENCH THEREFOR

Nathaniel H. Lieb, Narberth; Albert D. Alderman, Jr., Skippack, and James L. Alago, Lansdale, all of Pa., assignors to Venture Technology, Inc., West Conshohocken, Pa.

Filed May 7, 1980, Ser. No. 147,696
Int. Cl.[3] A61C 1/08
U.S. Cl. 433—126 19 Claims

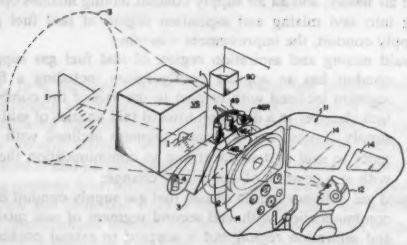



1. A dental handpiece comprising a turbine housing, a turbine rotatably mounted therein, a collet secured within said turbine, said collet having a plurality of jaws at the bottom thereof, said collet being externally threaded in the area of said jaws, a collet nut threadedly secured on said collet at said threads, said collet being externally tapered at the bottom thereof, said collet nut being internally tapered, with the taper of said collet nut complementing the taper of said collet, means for rotating said collet relative to said collet nut whereby the advancing of said collet nut on said collet causes the compressing of said collet jaws through the pressure of the mating of said tapered surfaces, and means on said collet nut to prevent said collet nut from becoming disengaged from said collet during the rotation of said collet.

## 4,313,726
## ENVIRONMENTAL FOG/RAIN VISUAL DISPLAY SYSTEM FOR AIRCRAFT SIMULATORS

Wendell D. Chase, Saratoga, Calif., assignor to The United States of America as represented by the Administrator of National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 29, 1979, Ser. No. 53,566
Int. Cl.[3] G09B 9/08
U.S. Cl. 434—42 30 Claims



1. Apparatus for visually simulating to a pilot trainee the flight of an aircraft through environmental conditions to an aircraft landing site comprising:

means accessible to said trainee for enabling said trainee to control the flight of said aircraft;

means for displaying a color image of said landing site and the terrain adjacent thereto, said displaying means including a color television monitor;

environmental condition simulation means for dispersing natural water particles into the optical path between said trainee and said image;

lamp means for directing a controlled amount of light downward on said water particles, said lamp means having a spectra substantially similar to that of the sun;

optical means for collimating the light from said image and the light scattered from said water particles to enhance the depth effect perceived by said pilot trainee;

means responsive to said enabling means for controlling the image viewed by said trainee; and

means responsive to the position of said aircraft relative to said landing site for controlling the amount and size of water particles in said optical path;

said environmental condition simulating means comprising;

an environmental effects chamber having two walls having transparent portions disposed in said optical path between said pilot trainee and said image;

a container with an opening adapted to release water particles into said chamber.

means for maintaining a supply of water within said container at a predetermined level;

a manifold submerged in said water and having a plurality of exhaust orifices located near the water surface;

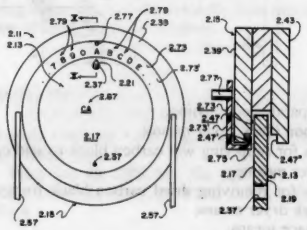
a plurality of stacked screens located above said water and said exhaust orifices; and

means for driving air through said manifold and exhaust orifices whereby water particles are jetted through said screens and allowed to escape said container via said opening.

## 4,313,727
## EDUCATIONAL FRAME DEVICE HAVING A ROTATABLE BODY AND ROTATABLE SYMBOL-BEARING INSERTS

Johnathan J. Hults, 4022 Ridgedale St., Memphis, Tenn. 38127

Continuation-in-part of Ser. No. 951,782, Oct. 16, 1979, abandoned. This application Nov. 30, 1979, Ser. No. 98,915
Int. Cl.[3] G09B 1/22, 19/12; A43C 15/00
U.S. Cl. 434—174 3 Claims



1. A board-type educational device comprising: a body member having a substantially flat face surface, and a frame means for extending around at least a portion of the periphery of said face surface of said body member; said body member having a pointer indicia means attached to said face surface thereof, said pointer indicia means pointing towards the periphery of said face surface of said body member, said frame means having a face surface located substantially adjacent the periphery of said face surface of said body member and having a plurality of spaced apart symbol indicia means attached to said face surface thereof, said pointer indicia means and said symbol indicia means being rotatable relative to one another whereby said pointer indicia means can be selectively caused to point towards various specific ones of said symbol indicia means of said frame means, said face surface of said body member including means for allowing indicia to be drawn thereon, said body member being in the shape of a substantially flat, substantially thin disk, said frame means being in the shape of a ring and extending completely around the periphery of

said body member and including insert means for being rotatably attached to said face surface of said frame means, said symbol indicia means being attached to said insert means for rotation therewith.

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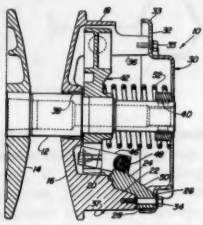
**4,313,728**

## VARIABLE SPEED DRIVE CLUTCH

**Keni K. Prasad, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.**

**Filed Feb. 19, 1980, Ser. No. 122,594**
**Int. Cl.³ F16H *11/06, 55/52***
**U.S. Cl. 474—14** **2 Claims**



2. In a variable speed pulley including a drive shaft, a first sheave half fixed on the shaft, a second sheave half axially shiftably mounted on the shaft beside the first sheave half and including an annular rim extending axially away from the first sheave, a spider member fixed to the shaft within the annular rim, a plurality of flyweights mounted on the spider at equally spaced angular locations and including rollers, a plurality of stepped surface portions located on the inside of the annular rim at angular locations coinciding with those of the flyweights, a plurality of ramp elements respectively shaped complementary to and seated in the stepped surface portions and including radially outer end portions forming axial extensions of the rim, a plurality of fasteners respectively extending through the outer end portions of the ramp elements for securing the latter in place against the plurality of stepped surfaces, a wall releasably secured to the annular rim and cooperating therewith to form a housing enclosing the spider and flyweights, and a compression spring acting between the spider and the cover for biasing the second sheave half away from the first sheave half, the improvement comprising, said wall being seated against the outer end portions of the ramp elements and said plurality of fasteners also serving to releasably secure the wall to the annular rim.

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**4,313,729**

## ADJUSTABLE MOUNT FOR A BELT IDLER PULLEY

**Larry R. James, Olathe, Kans., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.**

**Filed Mar. 26, 1980, Ser. No. 134,187**
**Int. Cl.³ F16H *7/12***
**U.S. Cl. 474—135** **5 Claims**

1. A mechanism for adjustably mounting a belt idler pulley on a support wall characterized by

a mounting structure supporting said belt idler pulley presenting an opening and

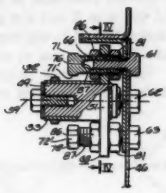
means adjustable securing said mounting structure to said support wall including

a threaded stud nonrotatably secured to and extending from said support wall,

an adjustable sleeve-like mounting member extending respectively through said opening in said mounting structure and having

a threaded cavity extending from one end of said member and in threaded engagement with said threaded stud,

a threaded exterior portion concentric with said threaded cavity,



shoulder means fixed on said one end of said member in abutting relation to said mounting structure to limit movement of the latter in the direction toward said support wall, and

a wrench-receiving portion on the other end of said member, and

a lock nut in threaded engagement with said threaded exterior of said member and operable to exert thrust against mounting structure in the direction toward said support wall.

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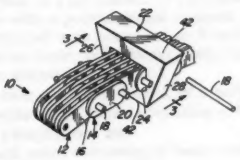
**4,313,730**

## METAL CHAIN BELT

**Edward H. Cole, Jr., Ithaca; John M. Kern, Moravia, and James A. Wyckoff, Interlaken, all of N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.**

**Filed Mar. 17, 1980, Ser. No. 130,772**
**Int. Cl.³ F16G *13/08***
**U.S. Cl. 474—201** **6 Claims**



1. A flexible power transmission belt assembly especially adaptable for use in a pulley transmission comprising:

a plurality of interleaved sets of links;

means joining each set of links to its next adjacent set of links to permit articulation of said assembly;

each joining means extending laterally beyond the side edges of the links; and

a plurality of metal load blocks surrounding said links, each of said load blocks being positioned between adjacent joining means in substantial contact therewith to transmit load to said joining means and thus to said links, each load block having side edges contoured to contact the pulleys of a transmission.

**4,313,731**

## MONO-AZO COMPOUND, MONO-AZO DYE AND DYEING PROCESS FOR POLYESTER FIBERS

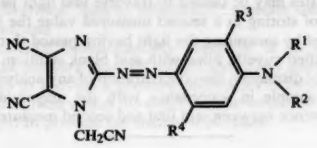
**Seiichi Imahori, Kawasaki; Kiyoshi Himeno, Yokohama, and Maeda, Shuichi, Saitama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan**

**Filed Sep. 12, 1980, Ser. No. 186,372**

**Int. Cl.³ D06P *5/12*; C09B *12/36***

**U.S. Cl. 8—451** **3 Claims**

1. A mon-azo dye represented by the following general formula:



wherein $R^1$ and $R^2$ individually represent hydrogen atom, substituted or non-substituted alkyl group, alkenyl group, and cyclohexyl group, $R^3$ represents hydrogen atom, chlorine atom, bromine atom, alkyl group, substituted or non-substituted alkoxy group or alkenyl group, and $R^4$ represents hydrogen atom, chlorine atom, bromine atom, alkyl group, alkoxy group, hydroxy group, acylamino group, alkoxycarbonylamino group, aralkyloxycarbonylamino group or alkylaminocarbonylamino group.

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**4,313,732**

## PROCESS FOR IMPROVING WASHFASTNESS OF INDIGO-DYED FABRICS

**Edward W. Teague, Raleigh; Louis A. Graham, and Bobby L. McConnell, both of Greensboro, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.**

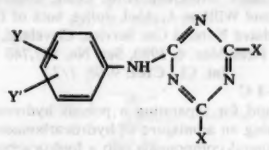
**Continuation of Ser. No. 202,430, Oct. 30, 1980, abandoned, which is a continuation of Ser. No. 112,499, Jan. 16, 1980, abandoned. This application Dec. 2, 1980, Ser. No. 212,109**

**Int. Cl.³ C09B *62/00***

**U.S. Cl. 8—541** **9 Claims**

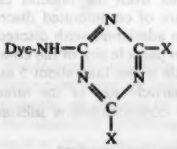
1. A process for fixing indigo dye on a cellulosic fiber substrate to improve the washfastness thereof comprising applying to an indigo-dyed substrate a fixing solution of:

(1) a dihalo-s-triazine of the formula:



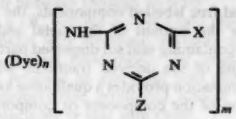
wherein Y and Y' which are the same or different are selected from sulfonic, phosphonic, phosphoric or carboxylic groups, provided that one of Y or Y' may be hydrogen, and X is chlorine, fluorine or bromine;

(2) a dihalo-s-triazine reactive dye of the formula:



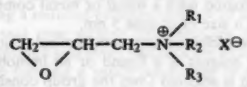
wherein Dye is a chromophore and X is as defined above;

(3) a poly(halo-s-triazine) reactive dye of the formula:



where each Dye, which represents a chromophore, may be terminally or internally bonded to one or more of the triazine rings; n is 1 or 2, m is 2 or 3, X is as defined above; and Z is at least one of X, NH, a non-colored bridging link which may be or include another triazine ring, or combinations of two or more of these:

(4) a quaternary ammonium compound of the formula:



wherein $R_1$, $R_2$, and $R_3$, which are the same or different are $C_1$–$C_3$ alkyl groups and X is as defined above;

(5) mixtures of (1) and (2); or

(6) mixtures of (1) and (3);

at a pH of 7.0 to about 12, and thereafter curing the thus treated substrate.

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**4,313,733**

## ASSISTANT MIXTURE FOR THE DYEING OR FLUORESCENT BRIGHTENING

**Jacques Zurbuchen, Kaiseraugst, Switzerland; Alain Lauton, St. Louis, and Jean P. Luttringer, Rixheim, both of France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Feb. 11, 1980, Ser. No. 120,233**

**Claims priority, application Switzerland, Feb. 13, 1979, 1402/79**

**Int. Cl.³ D06P *1/62, 1/60, 1/613, 1/667***

**U.S. Cl. 8—582** **36 Claims**

1. An assistant for the dyeing or fluorescent brightening which comprises at least

(A) an acid ester, or a salt thereof, of a polyadduct of propylene oxide with a polyfunctional aliphatic amino or hydroxy compound with contains 2 to 9 carbon atoms and has at least one amino or hydroxyl group capable of entering into an addition reaction;

(B) an acid ester, or a salt thereof, of a polyadduct of an alkylene oxide with a phenol containing at least one alkyl, benzyl or phenyl group and

(C) an aliphatic ester, containing at least 6 carbon atoms, of a mono- or di-carboxylic acid.

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**4,313,734**

## METAL SOL PARTICLE IMMUNOASSAY

**Johannes H. W. Leuvering, Heesch, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.**

**Filed Jul. 13, 1979, Ser. No. 57,309**

**Claims priority, application Netherlands, Jul. 13, 1978, 7807532**

**Int. Cl.³ G01N *33/54, 33/58***

**U.S. Cl. 23—230 B** **48 Claims**

1. The process for the detection and/or determination of one or more components of the reaction between a specific binding protein and the corresponding bindable substance in an aqueous test sample, by applying the known binding affinity of such components for one another, comprising:

(a) employing one or more labelled components, obtained by coupling directly or indirectly the desired component of said reaction to particles of an aqueous sol dispersion of a metal, metal compound or polymer nuclei coated with a metal or metal compound, having a particle size of at least 5 nm, and

(b) detecting and/or determining during the reaction or after an adequate reaction time and optionally after separation of the bound and free labelled components, the physical properties and/or the amount of the metal and/or a formed agglomerate containing said sol dispersed particles in the test sample or one of the derived fractions, which detection and/or determination provides a qualitative and/or quantitative indication of the component or components to be detected and/or determined.

14. A test kit, to be used for the detection and/or determination of one or more components of the reaction between a specific binding protein and a corresponding bindable substance thereto in an aqueous medium according to a predetermined protocol, comprising:

(a) a metal-labelled component which has been obtained by coupling a component of said reaction to particles of an aqueous sol dispersion of a metal, metal compound or polymer nuclei coated with a metal or metal compound, which parties have a size of at least 5 nm;

(b) one or more additional immunochemical reagents of which at least one reagent is a ligand or an immobilized ligand, which ligand is selected from the group consisting of

(aa) a ligand capable of binding with the metal-labelled component (a);

(bb) a ligand capable of binding with a binding partner of the metal-labelled component (a);

(cc) a ligand capable of binding with at least one of the component(s) to be determined; and

(dd) a ligand capable of binding with at least one of the binding partners of at least one of the component(s) to be determined; and

(c) directions for the performance of a protocol for the detection and/or determination of one or more components of an immunochemical reaction in an aqueous medium between a specific binding protein and a corresponding bindable substance thereto.

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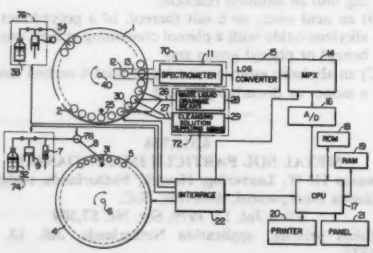
## 4,313,735
## AUTOMATIC CHEMICAL ANALYZING METHOD AND APPARATUS

**Katsuji Yamashita, Katsuta, and Yasushi Nomura, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Aug. 22, 1980, Ser. No. 180,476**
**Claims priority, application Japan, Aug. 22, 1979, 54/105904**
**Int. Cl.³ G01N** *35/04, 35/06*
**U.S. Cl. 23—230 R** **6 Claims**




1. An automatic chemical analyzing method comprising

a step of putting a sample and a reagent into at least specified one of a train of cuvettes to produce a reactant solution, said train of cuvettes being conveyed along a circular path;

a step of conveying said train of cuvettes along said circular path each time reagent is added to a sample, and of causing all of said cuvettes to traverse the light beam in the light measuring apparatus placed in said circular path;

a step of storing as a first measured value the value obtained by measuring the light having passed through said specified cuvette filled with said reactant solution;

a step of draining said reactant solution out of said specified cuvette;

a step of pouring blank solution into said specified cuvette which was previously emptied during the period for which said specified cuvette is at rest;

a step of producing reactant solution in at least one of said cuvettes other than said specified cuvette during said period of said specified cuvette being at rest;

a step of conveying said train of cuvettes along said circular path each time blank solution is added, so that all the cuvettes may be caused to traverse said light path;

a step of storing as a second measured value the value obtained by measuring the light having passed through said specified cuvette filled with said blank solution; and

a step of displaying the concentration of any analysis item in said sample in accordance with the magnitude of the difference between said first and second measured values.

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## 4,313,736
## FIELD TEST FOR METHAQUALONE AND MECLOQUALONE

**John F. Fischer, 2409 Oberlin Ave., Orlando, Fla. 32804, and Wayne A. Morris, 400 S. Edgemon, Winter Springs, Fla. 32708**

**Filed Dec. 8, 1980, Ser. No. 214,128**
**Int. Cl.³ G01N** *31/22, 33/15*
**U.S. Cl. 23—230 M** **6 Claims**

1. A method of indicating the presence of methaqualone or mecloqualone comprising the steps of:

adding a quantity of a formic acid solution of predetermined concentration to the sample;

adding a quantity of sodium nitrite solution, so that the ratio of formic acid to sodium nitrite is between 20 to 1 and 83 to 1 by weight;

adding a quantity of non-polar organic liquid sufficient to form two distinct layers, one of which primarily consists of the non-polar organic liquid; and

visually detecting a yellow color which is extracted in the non-polar organic liquid layer.

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## 4,313,737
## METHOD FOR SEPARATING UNDESIRED COMPONENTS FROM COAL BY AN EXPLOSION TYPE COMMINUTION PROCESS

**Lester G. Massey, Moreland Hills, Ohio; Robert I. Brabets, Lombard, and William A. Abel, Joliet, both of Ill., assignors to Consolidated Natural Gas Service, Cleveland, Ohio**

**Filed Mar. 6, 1980, Ser. No. 127,740**
**Int. Cl.³ C10L** *9/08, 1/32*
**U.S. Cl. 44—1 C** **42 Claims**

1. A method for separating a porous hydrocarbonaceous solid containing an admixture of hydrocarbonaceous components and mineral components into a hydrocarbonaceous enriched fraction and a mineral enriched fraction which comprises

(a) comminuting the hydrocarbonaceous components of the hydrocarbonaceous solid selectively without substantially comminuting the mineral components therein under conditions sufficient to substantially scission the hydrocarbonaceous components from the mineral components and to produce a mixture of comminuted discrete hydrocarbonaceous particles in admixture with discrete mineral particles wherein the mean particle size of the comminuted hydrocarbonaceous particle is less than about 5 microns in diameter, and the mean particle size of the mineral particles both before and after comminution is substantially unchanged; and

(b) separating the resultant product.

4. A method according to claim 1 wherein the porous hydrocarbonaceous component is comminuted into a shattered prod-

uct having a volumetric mean particle size of less than about 5 microns in diameter, by

(a) preparing a slurry of a liquid and the hydrocarbonaceous solid;

(b) raising the pressure imposed on said slurry to a pressure above the critical pressure of the liquid to force liquid into the pores of the solid;

(c) raising the temperature of the slurry to a temperature above the critical temperature of the liquid to convert the liquid into a supercritical fluid;

(d) maintaining the slurry above the critical temperature and pressure of the liquid for a length of time sufficient to permit the supercritical fluid to substantially saturate the pores of the solid; and

(e) substantially instantaneously reducing, in an expansion zone, the pressure imposed on said slurry to a second lower pressure to provide a pressure differential between the supercritical fluid within the solids and the surface of the solids sufficient to provide the shattered product.

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**4,313,738**

## SUBSTITUTED DIHYDRO OXAZINES AS HYDROCARBON ANTIOXIDANTS

**Robert M. Parlman, and Lyle D. Burns, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.**

**Filed Apr. 14, 1980, Ser. No. 140,274**
**Int. Cl.³ C10L 1/14**
**U.S. Cl. 44—63** **4 Claims**

1. A hydrocarbon composition suitable as a fuel for combustion engines comprising a hydrocarbon fuel and an amount of substituted dihydro oxazine in the range of about 1 weight percent to about 0.0001 weight percent sufficient to stabilize said fuel against oxidative deterioration.

3. A method for stabilizing a hydrocarbon fuel for combustion engines comprising admixing with said hydrocarbon fuel an amount of substituted dihydro oxazine in the range of about 1 weight percent to about 0.0001 weight percent sufficient to stabilize said hydrocarbon fuel against oxidative deterioration.

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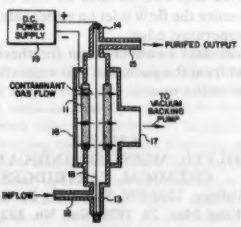
**4,313,739**

## REMOVAL OF CONTAMINANTS FROM GASES

**Diarmaid H. Douglas-Hamilton, Boston, Mass., assignor to Avco Everett Research Laboratory, Inc., Everett, Mass.**

**Continuation of Ser. No. 80,946, Oct. 1, 1979, abandoned. This application Oct. 27, 1980, Ser. No. 200,962**
**Int. Cl.³ B03C 3/00**
**U.S. Cl. 55—2** **4 Claims**




1. The method of selectively removing a first contaminant gas having a first ionization potential from admixture with a gaseous stream of a second gas having a second higher ionization potential and for selectively removing a first contaminant gas having a first electron attachment potential from admixture with a second gas having a second lower electron attachment potential, comprising:

(a) passing said admixture into an inlet end of an electrically conductive pipe section having an outlet end and a plurality of small passages through its wall;

(b) applying a DC voltage between said pipe section and a small diameter wire electrode centrally disposed in and extending at least substantially the length of said pipe section to produce an electrical field and a corona discharge therebetween, producing ionized molecules and attached electrons in said admixture;

(c) permitting charge exchange between molecules of said admixture of gases whereby ionization is transferred to contaminant gas molecules of lower ionization potential and whereby attached electrons are transferred to contaminant gas molecules of higher electron attachment potential;

(d) selecting polarity of said DC voltage so that said contaminant molecules are accelerated by said electric field to said wall of said pipe section where they are neutralized;

(e) providing a reduced pressure exterior of and around said wall of said pipe section for removing from said pipe section through said small passages gas adjacent thereto in a volume forming a small percentage of said admixture and comprising said contaminant gas molecules neutralized at said wall; and

(f) removing the remainder of said admixture through said outlet end of said pipe section as an admixture comprising essentially said second gas denuded of said first contaminant gas.

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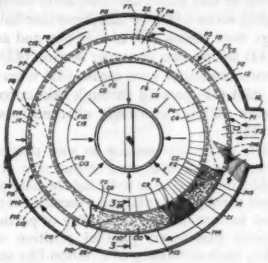
**4,313,740**

## AIR FILTER

**Calvin Kalishman, 5 Margaret Rd., Stoneham, Mass. 02180**

**Filed Dec. 8, 1980, Ser. No. 213,819**
**Int. Cl.³ B03C 3/00**
**U.S. Cl. 55—131** **13 Claims**



1. An air filter for filtering air to the carburetor of an internal combustion engine, comprising;

a toroidal-shaped housing having a bottom and inner and outer air-pervious side walls,

air cleaner housing means for supporting the toroidal-shaped housing defining with the housing a toroidal-shaped air passage adapted to extend about the outer side wall of the housing and having means defining an air inlet at one side of said housing and an outlet spaced from the inlet, said housing being positioned between the inlet and outlet,

and a plurality of replaceable adjacent cartridge filters located within said housing and each comprising a metal wool,

said filters each being of uniform density with different ones thereof having different porosity with the more dense filter disposed closer to the air inlet and the less dense filter disposed remote from the air inlet with said dense to less dense filters extending circumferentially,

whereby uniform air dispersion occurs through the filters,

said air flow passing from the air inlet branching in a circular flow to either side of the housing,

said toroidal-shaped air passage having uniform width there-

about with uniformity of flow being attained by filter density variation.

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**4,313,741**

## ELECTRIC DUST COLLECTOR

**Senichi Masuda, 605 Nishigahara 1-chome, Kita-ku, Tokyo, Japan 114, and Naoki Sugita, 52-Izumi-cho, Itabashi-ku, Tokyo, Japan 174**

**Continuation-in-part of Ser. No. 39,206, May 15, 1979, abandoned. This application Jul. 21, 1980, Ser. No. 170,911**

**Claims priority, application Japan, May 23, 1978, 53-61426; May 23, 1978, 53-61427; Jul. 18, 1978, 53-87319; Jul. 28, 1978, 53-91560; Nov. 22, 1978, 53-161115[U]**

**Int. Cl.³ B03C** *3/12, 3/45*

**U.S. Cl. 55—138** **5 Claims**

1. In an electric dust collector, including

(a) a case (9) having a longitudinal dust treatment travel path defined therein, with a dust-containing gas inlet (10) on one side of said travel path, a clean gas outlet (11) on the other side of said travel path, and, a dust collection zone having an input side at one end receiving dust-containing gas from said gas inlet and an output side at the other end to discharge clean gas through said gas outlet; the improvement in said dust collection zone comprising:

(b) a charging section (45) on said input side having a corona discharge wire means (42) at said one end and, electrode means (41) within said charging section (45) spaced from said corona discharge wire means (42) whereby gas from the gas inlet (10) passing through said corona discharge wire means (42) is electrically charged in said charging section (45);

(c) a particle collection section in said particle collection zone, intermediate said zone input side and said zone output side, disposed so as to be fed the charged gas which has passed through the charging section (45) said particle collection section having a plurality of particle attracting alternatively positioned parallel positive and negative electrodes, each consisting of a ribbon-like shaped insulating material having side edges, with an electrically conductive layer thereon, spaced from said side edges and of a width considerably narrower than that of the ribbon-like shaped insulating material so as to define insulating sections on both sides of said conductive layer;

(d) insulative spacing arrangement means positioned and arranged with respect to said insulating sections to provide air passage gaps between said electrodes; and,

(e) flame arrester net means (47) disposed on the output side to prevent the accidental propagation of fire to the outside of the dust collection zone.

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**4,313,742**

## MULTIPLE ANGLE SINGLE STAGE SCRUBBER

**L. David Ostlie, Rte. 1, Becker, Minn. 55308**

**Continuation of Ser. No. 33,509, Apr. 26, 1979, abandoned. This application Jul. 10, 1980, Ser. No. 168,181**

**Int. Cl.³ B01D** *47/06*

**U.S. Cl. 55—241** **5 Claims**

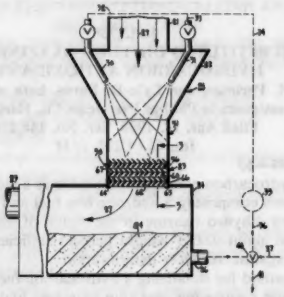
1. A scrubber for cleansing flue gases comprising, in combination:

a channel having a flue gas inlet adjacent an upper end of the channel and a flue gas outlet disposed below said inlet, said channel extending generally vertically for guiding the flue gases downwardly from said inlet to said outlet;

means in said channel for introducing scrubbing liquid into gas flowing downwardly in said channel whereby said liquid and gases flow generally downwardly concurrently;

a scrubber stage in said channel below the last-named means for causing intimate contact between the gases and the liquid, said scrubber stage comprising an array of deflecting means extending across said channel, said deflecting means including first and second rows of generally parallel, generally horizontal deflecting members of generally L-shaped cross-section;

mounting means for supporting said first row of members above said second row of members in a vertically spaced generally parallel relationship, with said members in mutually spaced generally parallel relation with the vertices of said members directed along a horizontal axis to which said members are transverse whereby a plurality of flow paths are defined by adjacent ones of said members;



each of said deflecting members of said first and second rows having an upper arm and a lower arm extending downwardly at an angle therefrom, adjacent pairs of said upper arms defining a flow inlet to a respective one of said flow paths and adjacent pairs of said lower arms defining a flow outlet from a respective one of said flow paths, an uppermost edge of each of said upper arms of said second row of deflecting members being disposed in an area between a vertical projection from a lowermost edge of adjacent lower arms of said first row of deflecting members whereby downwardly flowing gases and liquid exiting one of the flow paths defined by members of said first row are divided into two streams by one of said uppermost edges to enter the flow inlet on either side of said last-mentioned uppermost edge;

means below said scrubber stage for thereafter separating the liquid from the gases and said separating means having clean gas outlet means.

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**4,313,743**

## ELECTROLYTIC MOISTURE INDICATOR INSIDE CHEMICAL CARTRIDGES

**Richard A. Wallace, 7304 SW. 53rd Ave., Portland, Oreg. 97219**

**Filed Mar. 24, 1980, Ser. No. 132,854**

**Int. Cl.³ B01D** *53/04*

**U.S. Cl. 55—275** **3 Claims**

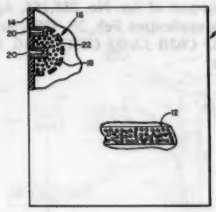
1. In combination with a walled container having an interior air space and a predetermined quantity of hydroscopic sorbent chemicals in said air space having a first predetermined affinity for moisture, an electrolytic moisture detection device for detecting the occurrence and degree of moisture intrusion within said container and comprising:

(a) an enclosure mounted in one of the walls of said container such that a portion of said enclosure extends into

said air space in spaced relation with said hydroscopic sorbent chemicals;

(b) said enclosure comprising perforated wall means which define a plurality of openings in said portion of said enclosure extending into said air space for permitting moisture to enter into said enclosure;

(c) a plurality of superhydroscopic salt particles contained in said enclosure, each having a cross section greater than that of said openings, a second predetermined affinity for



moisture greater than said first predetermined affinity and significantly high ohmic resistance when dry; and

(d) a pair of electrically conductive terminals mounted in said enclosure in spaced apart relation and electrically insulated from one another, both of said terminals engaging said particles and being positioned and arranged with respect to said one wall to thereby define means for coupling said device with a D.C. voltage source and terminal to the other through said particles.

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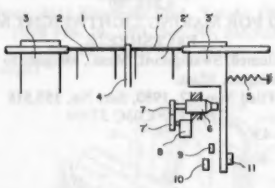
**4,313,744**

## METHOD AND DEVICE FOR AUTOMATICALLY FUSING OPTICAL FIBERS

**Yuichi Toda, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed Apr. 11, 1980, Ser. No. 139,522**
**Int. Cl.³ C03B *23/20***
**U.S. Cl. 65—4.21** **5 Claims**



3. A method for fusing optical fibers in which optical fibers are held by fiber supporting stands and fiber holding stands, one fiber holding stand being movable and initially retained by lock means, the ends of said optical fibers initially held in abutment with both sides of a reference element, comprising the steps of: retracting said reference element; releasing said lock means to allow said movable fiber holding stand to move to a micrometer head; operating an electric motor to move said micrometer head backwardly to allow said movable fiber holding stand to move forwardly to a position in abutment with a first stop; retracting said first stop; starting a discharge heat source a predetermined period of time after retracting said first stop; moving said micrometer head further backwardly to allow said movable fiber holding stand to move forwardly to a second position in abutment with a second stop; stopping said discharge heat source; and returning said movable fiber holding stand, said reference element, said first stop and said micrometer head to their initial positions.

5. A method for fusing optical fibers in which optical fibers are held by fiber supporting stands and fiber holding stands, one of said fiber holding stands being movable, the ends of said optical fibers initially held in abutment with both sides of a reference element, comprising the steps of: retracting said reference element; operating a pulse motor to move a micrometer head backwardly to allow said movable fiber holding stand to move to a first predetermined position; starting a discharge heat source a predetermined period of time after said movable fiber holding stand has reached said first predetermined position; moving said micrometer head further backwardly by operation of said pulse motor to allow said movable fiber holding stand to move forwardly to a second predetermined position; stopping said discharge heat source; and returning said movable fiber holding stand, said reference element and said micrometer head to their initial positions.

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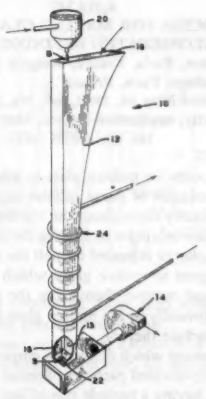
**4,313,745**

## METHOD OF FORMING FROZEN SPHERES IN A FORCE-FREE DROP TOWER

**Alan M. Lovelace, Acting Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and James M. Kendall, Jr., Pasadena, Calif.**

**Filed Dec. 24, 1980, Ser. No. 219,680**
**Int. Cl.³ C03B *19/10***
**U.S. Cl. 65—21.4** **6 Claims**



1. A method of forming solid spheres from a hardenable liquid material, the steps comprising:

A. establishing a flowing stream of gaseous fluid with said stream flowing in a substantially vertical downward direction;

B. introducing droplets of hardenable liquid material into said stream with the droplets accelerating in the direction of said stream and at a common rate of acceleration with said stream, which rate is substantially one-G; and

C. cooling said droplets a sufficient amount within said stream to harden said droplets.

4,313,746

## PROCESS FOR MAKING FORMED GLASS FROM PLATE GLASS

Karl-Heinz Juras, Mainz-Mombach, Fed. Rep. of Germany, assignor to Jenaer, Glaswerk, Schott & Gen., Fed. Rep. of Germany

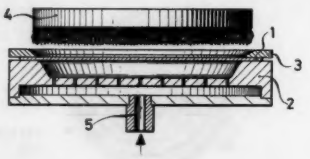
PCT No. PCT/DE79/00076, § 371 Date Apr. 3, 1980, § 102(e) Date Apr. 3, 1980, PCT Pub. No. WO80/00336, PCT Pub. Date Mar. 6, 1980.

PCT Filed Jul. 21, 1979, Ser. No. 193,409

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1978, 2834867

Int. Cl.³ C03B *23/025*

U.S. Cl. 65—25.4 6 Claims




1. A process for making formed glass from plate glass, wherein a cut-to-size piece of plate glass is heated and lowered into a mold, and wherein during the heating, the softening piece of plate glass is prevented from lowering itself, the improvement consisting in that the piece of plate glass, during the heating, is carried by a gas cushion at super-atmospheric pressure, and that thereafter the lowering of the softened piece of plate glass is accelerated by using a vacuum in the hollow space between the mold and the piece of plate glass.

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4,313,747

## PROCESS FOR MAKING GLASS WITH AGGLOMERATED REFINING AGENTS

James L. Barton, Paris, France, assignor to Societe Generale pour l'Emballage, Paris, France

Filed May 16, 1980, Ser. No. 150,582

Claims priority, application France, May 17, 1979, 79 12572

Int. Cl.³ C03B *1/00*

U.S. Cl. 65—27 12 Claims

1. In the process for making glass in which a refining agent comprising a mixture of metal sulfates and reducing agents is dispersed uniformly throughout the vitrifiable charge of glassmaking raw materials prior to melting the charge, and in which the vitrifiable charge is heated to melt the charge and to cause the refining agent to evolve gases which enlarge bubbles of other gasses and remove them from the molten glass as the bubbles rise upwardly in the molten glass to escape therefrom at the upper surface thereof;

the improvement which comprises employing as the refining agent finely-divided particles of metal sulfate and a reducing agent having a particle size of less than about 0.1 mm, the finely-divided particles of metal sulfate and reducing agent being intimately mixed together and formed into agglomerates at least 10 times greater in size than the average particle size of their constituent materials, and wherein the relative amounts of reducing agent and metal sulfate in the agglomerates is such that the reducing agent can reduce at least one-fourth of the sulfate ions ($SO_4^{=}$) to the state of sulfide ions ($S^{=}$), and wherein the amount of refining agent added to the vitrifiable charge of glassmaking raw materials is such that the amount of created sulfide, expressed as $SO_3$, is at least 0.05% by weight of the glass to be obtained.

4,313,748

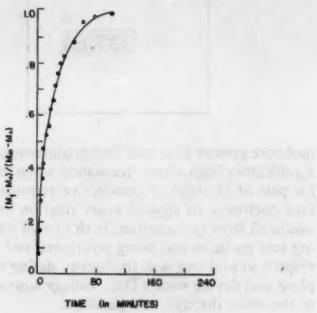
## METHOD FOR PRODUCING A STRENGTHENED GLASS STRUCTURAL MEMBER

Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20034, and Theodore A. Litovitz, 904 Devere Dr., Silver Spring, Md. 20903

Division of Ser. No. 917,101, Jun. 19, 1978, Pat. No. 4,220,682, which is a division of Ser. No. 635,727, Nov. 26, 1975, Pat. No. 4,110,096, which is a continuation-in-part of Ser. No. 462,481, Apr. 22, 1974, Pat. No. 3,938,974, and Ser. No. 559,512, Mar. 18, 1975, abandoned, said Ser. No. 462,481, is a continuation-in-part of Ser. No. 355,164, Apr. 27, 1973, abandoned. This application Feb. 25, 1980, Ser. No. 123,979

Int. Cl.³ C03B *32/00*; C03C *17/10, 17/25*

U.S. Cl. 65—30.1 2 Claims




1. Process for producing a rigid glass product which comprises washing a porous silicate glass with sodium hydroxide, then immersing the washed porous silicate glass in a liquid solution of a dopant in a liquid solvent therefor to stuff the pores of said washed glass with said solution, subsequently removing said solvent from said pores and thereafter heating to collapse said pores.

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4,313,749

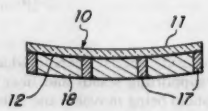
## METHOD FOR MAKING LIGHTWEIGHT MIRROR FACESHEETS

Robert L. Milamed, Swampscott, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed May 27, 1980, Ser. No. 153,518

Int. Cl.³ C03C *27/04*

U.S. Cl. 65—43 8 Claims




1. A method for making lightweight mirrors comprising:

a. providing a mirror means, said mirror means including a front reflective surface and a back surface,

b. metallizing a precise pattern on the back surface of said mirror means, and

c. soldering support structure to said mirror means at said metallized pattern.

5. A method for making glass lightweight mirror facesheets for active mirror systems comprising:

a. providing a thin mirror member;

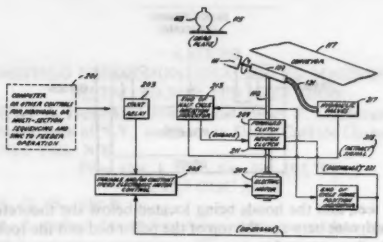
b. metallizing a precise pattern on the back surface of said mirror member, and

c. soldering stiffening ribs to said mirror member at said metallized pattern.

## 4,313,750
## ELECTRONICALLY CONTROLLED ROBOT FOR HANDLING GLASSWARE

**Donald A. Lulejian, Cornwells Heights; Alphonse W. Faure, Warminster, and Eugene F. Fijalkowski, Philadelphia, all of Pa., assignors to CSS International Corporation, Philadelphia, Pa.**

**Filed Sep. 12, 1980, Ser. No. 186,440**
**Int. Cl.³ C03B 9/40**
**U.S. Cl. 65—160** **58 Claims**



1. A camless electronic glassware conveyor delivery apparatus (GCDA) having pushout robot means being in operative association with glassware forming apparatus having at least one synchronous operation point, comprising:

camless electronic means responsive to said synchronous point for electronically controlling said pushout robot rotational operation including a digital stepping motor operatively coupled to rotate said pushout robot, said motor speed being varied with pulse signals which vary according to a stored program; and

means for electronically altering said pushout robot rotational operation by changing said stored program, said altering means being connected to said controlling means.

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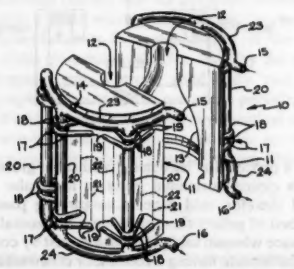
## 4,313,751
## MOLD WITH EXTERIOR HEAT CONDUCTING ELEMENTS

**Julius J. Torok, 3411 Kingsgate Blvd., Toledo, Ohio 43606**

**Filed Feb. 19, 1981, Ser. No. 235,923**
**Int. Cl.³ C03B 9/38, 11/12**
**U.S. Cl. 65—267** **14 Claims**



1. In a mold having a heat dissipating surface and a forming surface in heat transfer communication with the heat dissipating surface, the improvement of a conduit exterior of and spaced from the mold and a plurality of heat conducting elements mounted spaced from one-another along the length of the conduit, and extending to the surface of the mold each of which is in heat transfer communication with said conduit and with a portion of the heat dissipating surface, each of said elements being of such size, shape and material, and being so situated with respect to heat transfer from the heat dissipating surface that, when the mold is in service and a heat transfer fluid is circulated through said conduit, heat transfer from the heat dissipating surface, through said heat conducting elements and to the conduit maintains each segment of the forming surface at a predetermined temperature.

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## 4,313,752
## 2,2-DIMETHYLVALERIC ACID FOR GROWTH ENHANCEMENT OF SUGARCANE

**Sidney R. Siemer, Fresno, Calif., assignor to W. R. Grace & Co., New York, N.Y.**

**Filed Aug. 26, 1980, Ser. No. 181,731**
**Int. Cl.³ A01N 37/00**
**U.S. Cl. 71—27** **8 Claims**

1. A process for enhancing growth in sugarcane plants which comprises applying to the plant, 2,2-dimethylvaleric acid at a dosage rate per acre of 1 to 10 lbs.

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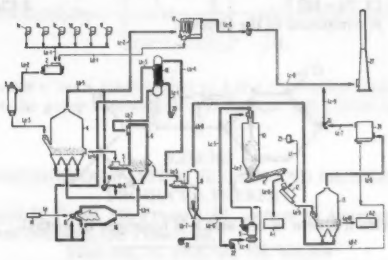
## 4,313,753
## PROCESS FOR PRODUCING POTASSIUM SILICATE FERTILIZER AND APPARATUS FOR PRACTICING SAID PROCESS

**Hiroshi Segawa, Tokyo, and Katsufumi Akizuki, Yokohama, both of Japan, assignors to Denpatsu Fly Ash Company, Tokyo, Japan**

**Filed Jun. 13, 1979, Ser. No. 48,121**
**Claims priority, application Japan, Jun. 13, 1978, 53-70380; Oct. 9, 1978, 53-123668**
**Int. Cl.³ C05D 1/00**
**U.S. Cl. 71—61** **41 Claims**



1. A process for producing citric acid soluble potassium silicate fertilizer, said process comprising:

(a) forming a mixture comprising a solution of caustic potash as a binder, potassium carbonate, fly ash and pulverized coal;

(b) kneading said mixture by means of a continuous kneader;

(c) forming the resulting kneaded mixture into granules by means of an extruder;

(d) drying said granules to a state of substantially absolute dryness by means of a fluidized dryer; and

(e) calcining the resulting dried granules by means of a fluidized calcining furnace in order to chemically react the potassium with silicon present in said fly ash and thereby form a citric acid soluble potassium silicate;

(f) cooling the product resulting from said fluidized calcining furnace by means of a high speed cooling device; and

(g) pulverizing said product into powder by means of a pulverizer.

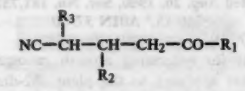
4,313,754

## POLYSUBSTITUTED BUTANOIC ACIDS, ESTERS AND DERIVATIVES THEREOF UTILIZING THE SAME AS HERBICIDES

Stephen S. Szucs, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 903,379, May 5, 1978, Pat. No. 4,224,052. This application Jan. 28, 1980, Ser. No. 115,838
Int. Cl.[3] A01N *43/40*
U.S. Cl. 71—94 4 Claims

1. A method for the control of undesirable monocotyledonous and dicotyledonous plant species comprising applying to the foliage and stems of said plants or to soil containing seeds or other propagating organs of said plants, a herbicidally effective amount of a compound of the formula:



wherein $R_1$ is OH, $OR_4$, $NR_5R_6$ or OM; $R_2$ and $R_3$ are each phenyl, monohalophenyl or pyridyl, provided that when $R_2$ is phenyl or monohalophenyl $R_3$ is pyridyl and when $R_2$ is pyridyl $R_3$ is phenyl or monohalophenyl; $R_4$ is alkyl $C_1$–$C_8$, monohaloalkyl $C_1$–$C_4$, monohaloalkynyl $C_3$–$C_4$, monohaloalkenyl $C_3$–$C_4$, alkoxy $C_1$–$C_4$ alkyl $C_1$–$C_4$ or hydroxyalkynyl $C_2$–$C_4$; $R_5$ and $R_6$ are each independently H or alkyl $C_1$–$C_2$; M is an alkali metal, ammonium, $C_1$–$C_8$ mono- or di-alkylammonium or hydroxyethylammonium.

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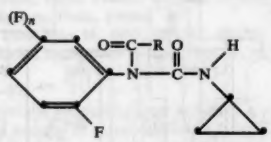
4,313,755

## N-CYCLOPYOPYL-N-(FLUOROPHENYL)-N-ACYLUREAS AND THEIR HERBIDICAL USE

Kurt H. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 170,421, Jul. 21, 1980, abandoned. This application Feb. 2, 1981, Ser. No. 230,777
Int. Cl.[3] E05B *63/14*; C07C *127/22*
U.S. Cl. 71—120 3 Claims

1. A compound of the formula:



wherein n is zero or one and R is hydrogen or methyl.

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4,313,756

## PROCESS FOR UPGRADING IRON ORE PELLETS

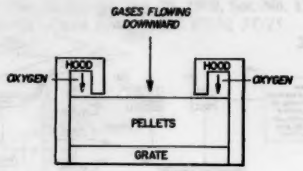
Kazuo Kiyonoga, Tarrytown, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 712,138, Aug. 6, 1976, abandoned. This application Dec. 19, 1977, Ser. No. 862,203
The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.
Int. Cl.[3] C22B *1/14*
U.S. Cl. 75—3 3 Claims

1. In a process for hardening oxidizable green iron ore pellets in a closed grate-kiln furnace adapted therefor, said process comprising passing the grate with a bed of pellets thereon along a horizontal path through the furnace to dry and preheat the pellets and then introducing the pellets into the kiln to undergo additional heating and induration, all by contact with hot gases, said grate passing through a preheating zone in which the average pellet temperature in the bed is in the range of about 1100° F. to about 2200° F. and in which zone the flow of gases is in a downward direction towards the bed of pellets on the grate,

the improvement comprising:

(a) covering the periphery of at least part of the zone with at least two hoods to provide a hooded area on each side of the top of the grate under which the periphery of the grate passes, the distance between the inner edges of the periphery of the grate, as measured horizontally from inner edge to inner edge across the width of the grate along a line perpendicular to the path of the grate, being at least about




4 feet, and the hoods being located below the theoretical midpoint between the top of the pellet bed and the roof of the furnace; and

(b) passing at least one gas stream consisting essentially of oxygen within each hooded area in such a manner that the stream flows in a downward direction towards and through the periphery of the bed of pellets on the grate passing through the hooded areas, the amount of oxygen being in excess of that theoretically required to convert any magnetite in the periphery to hematite.

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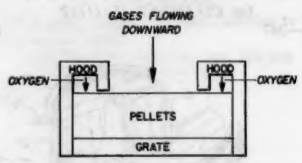
4,313,757

## PROCESS FOR UPGRADING IRON ORE PELLETS

Kazuo Kiyonoga, Tarrytown, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 712,137, Aug. 6, 1976, abandoned. This application Dec. 19, 1977, Ser. No. 862,202
The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.
Int. Cl.[3] C22B *1/14*
U.S. Cl. 75—3 3 Claims




1. In a process for hardening oxidizable green iron ore pellets in a closed horizontal grate or a circular grate furnace adapted therefor, said process comprising passing the grate with a bed of pellets thereon along a horizontal path through the furnace wherein said pellets are heated by contact with hot gases, the furnace having a zone in, or downstream of, the area where the peak temperature of the furnace is attained, in which zone the average pellet temperature is in the range of about 1100° F. to about 2200° F. and in which zone the flow of gases is in a downward direction towards the pellets on the grate

the improvement comprising:

(a) covering the periphery of at least part of the zone with at least two hoods to provide a hooded area on each side of the top of the grate under which the periphery of the grate passes, the distance between the inner edges of the periphery of the grate, as measured horizontally from inner edge to inner edge across the width of the grate along a line perpendicular to the path of the grate, being at least about

4 feet, and the hoods being located below the theoretical midpoint between the top of the pellet bed and the roof of the furnace; and

(b) passing at least one gas stream consisting essentially of oxygen within each hooded area in such a manner that the stream flows in a downward direction towards and through the periphery of the bed of pellets on the grate passing through the hooded areas, the amount of oxygen being in excess of that theoretically required to convert any magnetite in the periphery to hematite.

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**4,313,758**

## METHOD FOR ADDING UNALLOYED MAGNESIUM METAL TO MOLTEN CAST IRON

**William A. Henning, Lewiston, and Henry F. Linebarger, Amherst, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed Oct. 1, 1980, Ser. No. 192,702**
**Int. Cl.³ C22C *33/08***
**U.S. Cl. 75—130 R** **4 Claims**

1. A method for adding magnesium to a molten base iron which comprises preparing a blended mixture consisting essentially of unalloyed magnesium metal suitably sized about ¼" and finer with ferrosilicon base alloy suitably sized to ½" and finer; placing blended mixture in a suitable container; and plunging said container beneath molten base iron, the amount of unalloyed magnesium metal in said mixture being from about 4% to 40% by weight of the weight of said ferrosilicon base alloy and unalloyed magnesium.

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**4,313,759**

## WEAR RESISTANT ALUMINIUM ALLOY

**Derek Raybould, Preverenges, Switzerland, assignor to Institut Cerac S.A., Ecublens, Switzerland**

**Filed Jul. 16, 1980, Ser. No. 169,317**
**Claims priority, application Sweden, Jul. 16, 1979, 7906128**
**Int. Cl.³ B22F *3/00***
**U.S. Cl. 75—249** **8 Claims**

1. A wear resistant alloy of aluminium and iron-based material comprising iron-based powder particles in a matrix of aluminium powder particles, said powder particles being compacted, characterized thereby that the interparticle bonds have been produced by a shock wave pressure pulse, the rise time of which is sufficiently short to cause melting of the surface regions only of the aluminium particles whereby the particles are welded together into a strong solid body, said surface regions being rapidly cooled by the rest of the particles during the duration of said pressure pulse whereby chemical reactions between the iron-based and aluminium particles are avoided, and that the content of iron-based material is from 10% to 60% by volume.

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**4,313,760**

## SUPERALLOY COATING COMPOSITION

**Louis E. Dardi, and Srinivasan Shankar, both of Muskegon, Mich., assignors to Howmet Turbine Components Corporation, Muskegon, Mich.**

**Continuation-in-part of Ser. No. 43,146, May 29, 1979, abandoned. This application Aug. 16, 1979, Ser. No. 67,097**
**Int. Cl.³ B22F *1/00***
**U.S. Cl. 106—1.12** **10 Claims**

1. A coating composition for application to nickel, cobalt, and iron base superalloys consisting essentially by weight of from 10 to 50% chromium, 3 to 15% aluminum, up to 1.5% tungsten, 1 to 15% of a metal mixture, and the balance selected from the group consisting of nickel, cobalt and iron, and combinations thereof, said metal mixture consisting essentially of at least 20% by weight tantalum and the balance manganese, said

coating containing at least about 0.5% by weight tantalum and at least about 0.5% by weight manganese.

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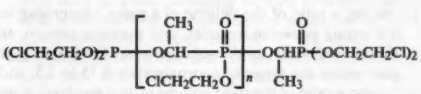
**4,313,761**

## REACTION PRODUCTS OF METAL OXIDES AND SALTS WITH PHOSPHORUS COMPOUNDS

**Samuel F. Joyce, III, Ballwin, Mo.; Albert W. Morgan, Collinsville, Ill.; Norman W. Touchette, and William Vanderlinde, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.**

**Division of Ser. No. 88,308, Oct. 25, 1979, Pat. No. 4,260,542, which is a division of Ser. No. 898,590, Apr. 21, 1978, Pat. No. 4,206,133, which is a division of Ser. No. 724,192, Sep. 17, 1976, Pat. No. 4,133,823, which is a continuation-in-part of Ser. No. 553,947, Feb. 28, 1975, abandoned, which is a continuation of Ser. No. 223,295, Feb. 3, 1972, abandoned. This application Oct. 24, 1980, Ser. No. 200,115**
**Int. Cl.³ C08K *5/59, 5/53***
**U.S. Cl. 106—18.19** **10 Claims**

1. A composition comprising a natural polymer and a reaction product of a phosphite/phosphonate of the formula



wherein n has a value from 0 to 4 and a compound selected from the group consisting of a metal oxide and a metal salt.

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**4,313,762**

## METHOD OF WASTING FLY ASH AND PRODUCT PRODUCED THEREBY

**Joseph H. Pound, Mt. Prospect, Ill., assignor to American Fly Ash Company, Des Plaines, Ill.**

**Filed Oct. 10, 1978, Ser. No. 949,659**
**Int. Cl.³ C04B *7/12***
**U.S. Cl. 106—85** **9 Claims**

1. In an environmentally acceptable method of disposing of fly ash, the steps of

conveying fly ash in a dry condition from a source location to a processing installation,

forming a pumpable slurry at the processing installation, said pumpable slurry consisting of fly ash and water,

said water content lying in the range of from no less than about 25% to no more than about 50% of weight of water to weight of dry fly ash,

said slurry further having the characteristic of being pumpable for a distance of up to several thousand feet,

depositing the fly ash-water slurry into a disposal site having wall means which contain the slurry until set up occurs,

said disposal site being exposed to ambient air and ground environmental conditions, and

hardening the slurry at the disposal site by subjection of said slurry to said conditions.

4,313,763

## CEMENT COMPOSITIONS CONTAINING SELF-SETTING POZZOLANS

Raymond C. Turpin, Jr., 3825 Wieuca Ter., NW., Atlanta, Ga. 30342

Continuation-in-part of Ser. No. 120,838, Feb. 12, 1980, Pat. No. 4,256,500, which is a continuation of Ser. No. 899,699, Apr. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 823,321, Aug. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 721,050, Sep. 7, 1976, abandoned. This application Oct. 29, 1980, Ser. No. 201,725

Int. Cl.³ C04B 7/02

U.S. Cl. 106—88 49 Claims

1. A cement composition consisting essentially of a portland cement, at least one self-setting pozzolan material, a fine aggregate, air, water, at least one alkali metal constituent selected from the group consisting of sodium, potassium and lithium ions, at least one anionic constituent, selected from the group consisting of chloride, bromide, nitrite, thiocyanate, cyanate and lactate, which is soluble in water and forms a calcium salt which is also soluble in water, and at least one water soluble oxide of boron compound, wherein:

(a) said alkali metal constituent is present in an amount up to approximately 4.0 percent by weight, in terms of the equivalent weight of said sodium ions, of said self-setting pozzolan material;

(b) said anionic constituent is present in an amount up to approximately 6.0 percent by weight, in terms of the equivalent weight of chloride ions, of said self-setting pozzolan material;

(c) said water soluble oxide of boron compound is present in the range of about 0.01 to 2.0 percent by weight, in terms of the equivalent weight of boron ions, of said self-setting pozzolan material; and

said cement composition being further characterized by;

(d) having a solid volume ratio of said portland cement to said self-setting pozzolan material within a range of approximately 0.05 to 2.0;

(e) having a ratio of the volume of a paste, comprising said self-setting pozzolan material, said portland cement, said air and said water, to the solid volume of said fine aggregate within the range of approximately 0.75 to 2.5; and

(f) having a ratio of the solid volume of said portland cement to the volume of said cement composition of less than about 0.19.

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4,313,764

## ISOCYANATE POLYOXYALKYLENES

David J. Tracy, Lincoln Park; Lindley S. Wood, Montclair, and Paritosh M. Chakrabarti, Wayne, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jul. 31, 1980, Ser. No. 174,047

Int. Cl.³ C08L 1/12, 33/20, 77/06; D06M 13/42

U.S. Cl. 106—188 1 Claim

1. The process of increasing the hydrophilicity of an hydrophobic polymeric material by incorporating in said material between about 0.01 and about 10 weight percent of an isocyanate of polyoxyalkylene product having the formula:

$$W-(AO)_x-(BO)_y-(CO)_z-DE$$

wherein E is amino or —W; W is an isocyanate radical; A, C and D represent lower alkylene of 2 to 4 carbon atoms; B is alkylene of 2 to 8 carbon atoms; y and z are each integers having a value of from 0 to 50; x is an integer having a value of from 2 to 50; and intermixtures of said isocyanate polyoxyalkylene compounds.

4,313,765

## SYNERGISTIC BLENDS OF CELLULASE-FREE XANTHAN GUM AND CELLULOSICS

John K. Baird, San Diego; Paul A. Sandford, Del Mar, and Jaewon L. Shim, San Diego, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 24, 1980, Ser. No. 190,546

Int. Cl.³ C09L 1/28, 5/00

U.S. Cl. 106—197 C 4 Claims

1. A 1:1 (weight basis) blend composition of cellulase-free xanthan gum and either carboxymethylcellulose, hydroxyethylcellulose or hydroxypropylmethylcellulose.

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4,313,766

## PROCESS FOR THE PRODUCTION OF A PIGMENT COMPOSITION

Ronald Barraclough, Johnstone, and Robert Langley, Glasgow, both of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 27, 1980, Ser. No. 153,646

Claims priority, application United Kingdom, Jun. 1, 1979, 19198/79

Int. Cl.³ C08K 5/34; C09B 47/04

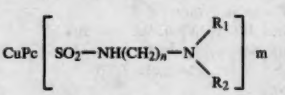
U.S. Cl. 106—288 Q 8 Claims

1. A process for the production of a pigment composition comprising:

(a) milling a crude copper phthalocyanine blue pigment in the presence of 0–50%, by weight of milled material, of a salt; and

(b) subsequently treating the milled material with from 0.5 to 20 parts by weight of the pigment in step (a) of a polar aliphatic solvent in the presence of 0.5 to 4 parts by weight of an aliphatic carboxylic acid having 1 to 10 C atoms, based on the weight of the additive in step (c); whereby

(c) 8 to 12% by weight based on crude pigment of a non-flocculating copper phthalocyanine additive of the formula I



(I)

wherein CuPc is the residue of copper phthalocyanine, m and n are each an integer of from 1 to 4, and $R_1$ and $R_2$ are each an optionally substituted alkyl group, or $R_1$ and $R_2$, together with the N atom to which they are bonded, form a heterocycle, is added to the crude milled pigment prior to, during or after the solvent treatment of step (b); and, (d) by the addition to the mixture obtained after removal of the solvent, of an amount of a base sufficient to give a pH 6–12, and subsequently filtering and drying the pigment composition is then isolated.

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4,313,767

## METHOD AND APPARATUS FOR CLEANING CONTAINERS WITH AN IONIZED GAS BLAST

Lester E. Bemis, Schaumburg; Charles M. Kincaid, Elgin, both of Ill., and Hugh L. White, Warrenton, Mo., assignors to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 100,196, Dec. 4, 1979, abandoned. This application Sep. 2, 1980, Ser. No. 183,589

Int. Cl.³ B08B 5/02, 9/08

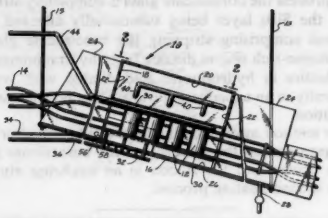
U.S. Cl. 134—1 12 Claims

1. A method for cleaning particulate matter from the interior of hollow container bodies open at one end and closed at the other, comprising the steps of:

(a) establishing a corridor by providing two parallel pressurized fluid curtains;

(b) moving said container bodies open-end down along said corridor between said pressurized curtains;

(c) subjecting the interior of said container bodies to an upwardly disposed blast of ionized gas to purge said particulate matter from said container bodies;
(d) entraining said expelled particulate matter in a liquid spray mist;



(e) condensing said mist to form a waste stream which includes said entrained particulate matter; and
(f) collecting and discharging said waste stream.

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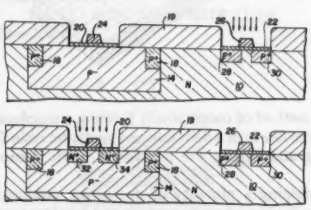
**4,313,768**

## METHOD OF FABRICATING IMPROVED RADIATION HARDENED SELF-ALIGNED CMOS HAVING SI DOPED AL FIELD GATE

**Thomas J. Sanders, and William H. White, both of Indialantic, Fla., assignors to Harris Corporation, Melbourne, Fla.**

**Filed Apr. 6, 1978, Ser. No. 893,929**
**Int. Cl.³ H01L *21/225, 7/00***
**U.S. Cl. 148—1.5** **10 Claims**



1. In a method of fabricating CMOS devices including forming source and drain regions in a first region of a first conductivity type and in a substrate of a second conductivity type opposite said first conductivity type using gates formed on gate oxides over portions of said first region and said substrate as masks, the improvement comprising:
forming said gate by a low temperature process on said gate oxide of a metal doped with the same semiconductor material as said substrate, and
forming said source and drain regions using said gates as masks by ion implantation and low temperature annealing.

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**4,313,769**

## COATING SOLUTION FOR METAL SURFACES

**Frank J. Frelin, Norristown; Timm L. Kelly, Oreland, and Anthony J. Malloy, Willow Grove, all of Pa., assignors to Amchem Products, Inc., Ambler, Pa.**

**Filed Jul. 3, 1980, Ser. No. 165,734**
**Int. Cl.³ C23F *7/06***
**U.S. Cl. 148—6.27** **34 Claims**

1. An acidic aqueous coating solution which is effective in forming a non-resinous, non-chromate, corrosion-resistant coating on an aluminum surface, said solution consisting essentially of a metal selected from the group consisting of zirconium, titanium and hafnium and mixtures of two or more of said metals, said metal being present in an amount of at least about $0.5 \times 10^{-3}$ m/l, fluoride in an amount at least sufficient to combine with all of said metal, and surfactant in an amount such that the coating formed from said solution has an improved tendency to resist being discolored by hot water.

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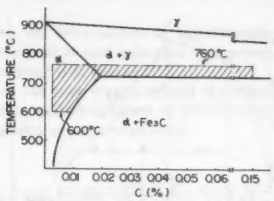
**4,313,770**

## METHOD OF PRODUCING COLD ROLLED STEEL STRIP HAVING IMPROVED PRESS FORMABILITY AND BAKE-HARDENABILITY

**Masashi Takahashi, Kawanishi, and Atsuki Okamoto, Ashiya, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan**

**Filed Jun. 13, 1980, Ser. No. 159,346**
**Claims priority, application Japan, Jun. 28, 1979, 54-82510; Jun. 28, 1979, 54-82511**
**Int. Cl.³ C21D *9/46, 9/48***
**U.S. Cl. 148—12 C** **7 Claims**




1. A method of producing a cold rolled steel strip having improved press formability and bake-hardenability, in which the steel consists essentially of:
C: 0.003–0.150%,
Si: not more than 1.50%,
Mn: 0.03–0.25%,
P: 0.03–0.20%,
sol. Al: 0.02–0.15%, N: 0.002–0.015%,
balance being iron and incidental impurities comprising hot rolling, pickling, cold rolling, then passing the resulting steel strip to a box annealing furnace in which the steel strip is subjected to recrystallization annealing by heating it at a temperature lower than 760° C. but higher than the recrystallization temperature of the steel in a steel composition area comprised of a single phase of ferrite or a dual phase of ferrite plus austenite in the Fe-C binary phase diagram and cooling it in the temperature range of from 500° C. to 200° C. at an average cooling rate of 10°–250° C./hr, and then temper rolling the annealed steel strip.

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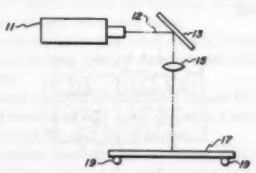
**4,313,771**

## LASER HARDENING OF STEEL WORK PIECES

**Roberto Lorenzo, Penfield, and Frank J. Wolf, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Feb. 29, 1980, Ser. No. 125,819**
**Int. Cl.³ C21D *1/06***
**U.S. Cl. 148—14** **8 Claims**



1. A method of heat treating the surface of carbon steel work pieces which comprises blackening the surface of the steel work piece by a blackening composition containing an alkali metal hydroxide, and an alkali metal nitrate or an alkali metal nitrite, so that at least 65% of the light emitted by a $CO_2$ laser is absorbed thereby, and directing a $CO_2$ laser beam having a

power output ranging from about 450 watts to about 600 watts at the surface of the work piece for a time sufficient to raise the surface temperature into the gamma range.

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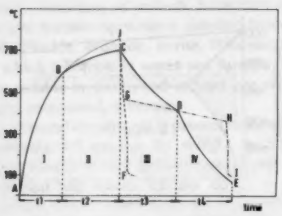
4,313,772

## CONTINUOUS HEAT-TREATMENT PROCESS FOR STEEL STRIP

Philippe A. Paulus, Liege, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed May 23, 1978, Ser. No. 908,684
Claims priority, application Belgium, May 24, 1977, 854999
Int. Cl.³ C21D *1/18, 9/52*
U.S. Cl. 148—142 2 Claims



1. A process for the continuous heat treatment of a cold-rolled steel strip, having a thickness of about from 0.05 to 1.0 mm for subsequent use in the production of tin plate of a class of hardness higher than $T_4$, comprising the sequential steps of heating said strip to a temperature within the range of about from 705° C. to 850° C., holding the strip at this temperature for more than one second, subjecting the resulting strip to a cooling operation comprising quenching the strip in an aqueous bath kept at a temperature higher than 75° C. for a time duration of less than 10 seconds, the strip emerging from the aqueous bath at a temperature of about from 75° C. to 300° C., holding the strip at a temperature of less than 300° C. for a time duration of at least one second and cooling the strip to ambient temperature.

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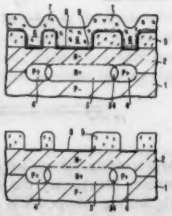
4,313,773

## METHOD FOR REMOVING BOROSILICATE AND BORON RICH OXIDES FROM A SILICON BODY PRIOR TO DOPING SILICON BODIES WITH A $SiB_6$ SOLID SOURCE

Marian Briska, Boeblingen; Gert Metzger, Schoenaich, and Klaus P. Thiel, Boeblingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 3, 1980, Ser. No. 212,304
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 2951292
Int. Cl.³ H01L *21/225, 21/306*
U.S. Cl. 148—188 11 Claims



1. In a method for doping silicon bodies where the silicon bodies are exposed in a first heating process to a gas mixture containing a predetermined boron quantity and boron and oxygen in a predetermined quantitative ratio to form a borosilicate glass layer, a boron-rich silicon dioxide layer and a $SiB_6$ layer, and where in a second heating process at least part of the boron is driven into the silicon, and that prior to the second heating process the borosilicate glass is completely stripped off without the $SiB_6$ layer being substantially affected, the improvement comprising stripping the borosilicate glass layer and the boron-rich silicon dioxide layer by first immersing the silicon bodies in hydrofluoric acid diluted with water and subsequently in an aqueous sulfuric acid/potassium permanganate solution.

9. The method as claimed in claim 1, wherein after the first heating process and the stripping of the borosilicate glass the boron is driven into the silicon in an oxidizing atmosphere during a second heating process.

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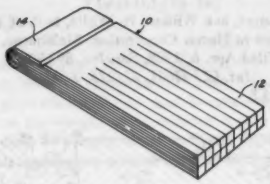
4,313,774

## MOPHEAD AND METHOD OF MANUFACTURING

Jack P. Arthur, Bel Air, Md., assignor to Wm. E. Hooper & Sons Co., Baltimore, Md.

Filed Jul. 10, 1980, Ser. No. 167,397
Int. Cl.³ A47L *13/20;* B32B *31/18, 31/20*
U.S. Cl. 156—73.1 10 Claims




1. The method of continuously forming a mophead made of a nonwoven fabric of a cellulose and synthetic resin fiber blend by sealing and cutting the nonwoven fabric comprising the steps of:

(a) combining a plurality of nonwoven continuous fabric sheets having a length, a width and a center area together in a composite superimposed stack;

(b) intermittently moving said composite superimposed stack to an ultrasonic sealing station and forming at least one ultrasonic seal continuously and transversely to the length of the sheet in the center area of said composite superimposed stack;

(c) intermittently moving said composite superimposed stack from said ultrasonic sealing station to a cutting station; and

(d) dividing said composite superimposed stack transversely into mophead widths while simultaneously cutting the mopheads to include a saddle portion defined by said at least one ultrasonic seal and a pair of plural strips extending inwardly from the ends of the mophead and communicating with the uncut saddle portion.

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4,313,775

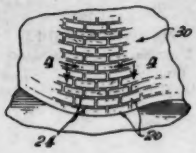
## WOOD BRICK

Luther L. Moore, 1862 Helena Ave., Reno, Nev. 89512

Filed Dec. 20, 1979, Ser. No. 105,508
Int. Cl.³ B32B *21/04, 31/04*
U.S. Cl. 156—196 4 Claims

1. The method for producing a simulated brick surface which includes: (1) cutting a thin slice of wood from a plank of lumber along a plane generally across the grain direction of said plank of lumber, said plane being at an angle different than a plane normal to two parallel surfaces of said plank; and resulting in surface irregularities on the bottom, top, and side edges of said thin slice of wood (2) applying an adhesive means

to a surface being prepared for a simulated brick covering; (3) pressing a plurality of said thin slices of wood onto said adhesive means on said surface in such a pattern as to produce a laid brick surface having grout-receiving spaces there between; (4) filling said grout-receiving spaces with a grout means in such a




manner that the grout means conforms to and is retained by the irregular edges formed on said slice of wood by said cut plane; and (5) applying a coating on the exposed surfaces of said slice of wood and said exposed grout means of a protective and color enhancing polyester coat.

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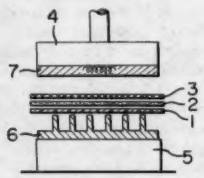
4,313,776

## METHOD OF PRODUCING SEAT CUSHION MEMBER

Muneharu Urai, Tokyo; Tadafumi Abe, Kokubunji; Youichiro Haraguchi, Hamuramachi, and Koji Hayashi, Akishima, all of Japan, assignors to Tachikawa Spring Co., Ltd., Akishima, Japan

Filed Dec. 11, 1979, Ser. No. 102,399
Claims priority, application Japan, Dec. 14, 1978, 53/153621; Dec. 20, 1978, 53/156297
Int. Cl.³ B29C *27/04;* B32B *31/14*
U.S. Cl. 156—220 9 Claims




1. A method of producing a seat cushion member comprising the steps of laminating a sheet of surface material, a sheet of untreated polyurethane foam material and a reinforcing web of fabric material in the above order, and subjecting said three-layer laminate to high-frequency dielectric heating by high-frequency welding means, while, at the same time, heating it by a second type of heating means, thereby locally fusing at least spaced areas of said sheet of untreated polyurethane foam material so as to weld said three layers into an integral structure at said spaced areas.

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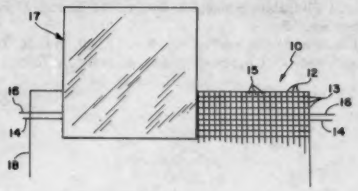
4,313,777

## ONE-STEP DUAL PURPOSE JOINING TECHNIQUE

John D. Buckley, Newport News; Robert J. Swaim, Hampton, and Robert L. Fox, Hayes, all of Va., assignors to The United States of America as Represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 30, 1979, Ser. No. 70,774
Int. Cl.³ B23K *13/00;* B29C *27/04*
U.S. Cl. 156—272 9 Claims

1. A method for fastening sheets of thermoplastics and providing electrical conduction means therethrough comprising:
sheathing conducting wires with insulation material;
positioning said conducting wires as selected longitudinal components of an inductive wire screen;
positioning said wire screen between the sheets of thermoplastics at the area to be joined;




subjecting the wire screen to electromagnetic energy to generate heat in said inductive wire screen for softening the thermoplastic sheets;
subjecting the wire screen to said electromagnetic energy for a time period sufficient to effect a bond between said wire screen and thermoplastics.

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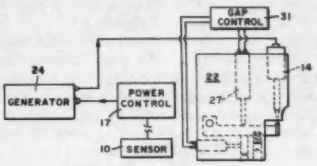
4,313,778

## ULTRASONIC SEAMING APPARATUS

Bruce L. Mims, Westport, Conn., assignor to Branson Ultrasonics Corporation, New Canaan, Conn.

Filed Sep. 22, 1980, Ser. No. 189,344
Int. Cl.³ B29C *27/08;* B32B *31/20*
U.S. Cl. 156—358 12 Claims




1. An ultrasonic seaming apparatus comprising:
an electroacoustic converter adapted to provide mechanical high frequency vibrations in response to applied electrical energy;
a horn coupled to said converter for receiving at an input end thereof said vibrations and providing at an opposite output end said vibrations to material in contact with said horn;
movable anvil means disposed opposite said output end of said horn for providing with said horn a nip through which thermoplastic material to be seamed is conveyed and seamed responsive to the transfer of ultrasonic energy from said output end to the material while the material is in forced contact with said horn;
force means coupled to said anvil means for urging said anvil means into motion toward contact with said output end of said horn;
motive means coupled to said anvil means for causing when actuated motion of said anvil means in a direction opposite to that urged by said force means;
clamping means disposed for clamping said anvil means in fixed position relative to said output end to maintain a predetermined gap between said output end and said anvil means responsive to the position of said output end, the force exerted by said force means, and the thickness of material disposed in said nip, and
control means coupled to said motive means and said clamping means for cyclically actuating said motive means and said clamping means whereby to cylically reset said gap

and maintaining said reset gap for a predetermined duration.

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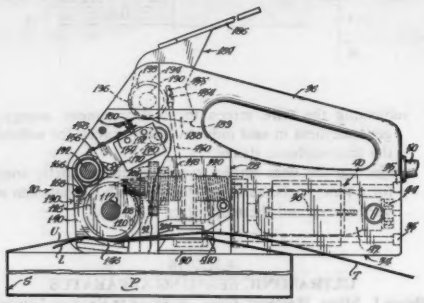
4,313,779

## ALL ELECTRIC FRICTION FUSION STRAPPING TOOL

Robert J. Nix, Park Ridge, Ill., assignor to Signode Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 61,900, Jul. 30, 1979, abandoned. This application Jun. 4, 1980, Ser. No. 153,782
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—361 35 Claims



1. A tool for constricting and closing a loop of thermoplastic strap that encircles an article and has overlapping strap segments, said tool comprising:

means for constricting said loop;

reversible motor means for rotating initially in a first direction and then in a second, opposite direction;

drive shaft means driven by said reversible motor means sequentially in said first and second directions of rotation for engaging and operating said constricting means to constrict said strap loop only when said drive shaft means is rotated in said first direction;

sensing and control means for sensing a predetermined level of tension in the constricted strap loop and for reversing the rotation of said motor means to change the rotation of said drive shaft means from said first direction of rotation to said second direction of rotation; and

means responsive to rotation of said drive shaft means in said second direction for pressing said overlapping strap segments together after said strap loop has been constricted to said predetermined tension level and for moving at least one of said overlapping strap segments relative to the other strap segment to effect a friction fusion weld of said overlapping segments.

29. In a tool for constricting and closing a loop of thermoplastic strap that encircles an article and has overlapping strap segments and that has a frame on which is mounted means for constricting said loop; sensing and control means for sensing a predetermined level of tension in the constricted strap loop; and means responsive to said sensing and control means for pressing the overlapping strap segments together after the loop has been constricted to said predetermined tension level and for moving at least one of said overlapping strap segments generally transversely of the strap length relative to the other strap segment to effect a friction fusion weld of said overlapping segments; the improvement comprising:

a saw blade having projecting saw teeth, said saw blade being pivotably mounted on said frame and being restrained against reciprocating movement, said saw blade being adapted to be pivoted between a lowered position for contacting a surface of said one overlapping strap segment and an elevated position in which the strap may be disposed in, or removed from the tool whereby, when said pressing means is moving said one overlapping strap segment relative to said other overlapping strap segment to effect a friction fusion weld of the overlapping segments, said one overlapping strap segment is moved across the teeth of said saw blade so that said saw blade cuts through said one overlapping strap segment before the welding of the straps is completed and thereby at least substantially severs the trailing portion of the strap loop from the tensioned strap loop encircling the article.

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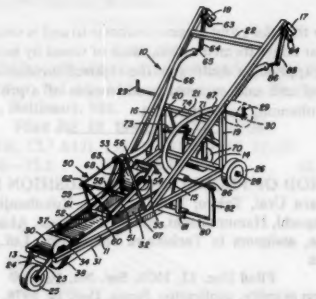
4,313,780

## ROADWAY STRIPER

Jere B. Ford, Jr., Dyersburg, Tenn., assignor to Jere B. Ford, Inc., Dyersburg, Tenn.

Filed Mar. 18, 1980, Ser. No. 131,686
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—523 10 Claims



1. A portable, hand-propelled or towable machine for applying marking tape to a roadway or like surface comprising, an elongated framework, transport wheels supporting said framework on the surface to be marked, means on said framework near the front thereof to support a spool of marking tape, pulling wheel means mounted on said framework for vertical movement via manually actuated means between a raised stowed position and a lowered position pressing said tape against the said surface, cutting means extending substantially normal to the longitudinal center line of said framework and mounted thereon above the tape for vertical movement, and a cutter bar mounted on said framework below said cutting means and movable via manually actuated means from a stowed position lateral of said center line and of said tape into a fixed working position across and normal to said center line below said tape and cooperable with said cutting means to sever said tape, said cutting means being mounted on said pulling wheel means and moving vertically therewith.

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4,313,781

## METHOD AND APPARATUS FOR CUTTING AND SEALING THERMOPLASTIC MATERIAL

Luis Rovigo, Flushing, N.Y., assignor to Ro-Ann Industries Corporation, Maspeth, N.Y.

Filed Jun. 26, 1980, Ser. No. 163,412
Int. Cl.³ B32B *31/00*; B31B *1/14*
U.S. Cl. 156—530 11 Claims

1. In cutting and sealing apparatus for use in a bag-making machine of the non-continuous type for manufacturing bags from a two-ply web of thermoplastic material of tubular flexible stock, including:

means for intermittently advancing the web in a downstream direction;

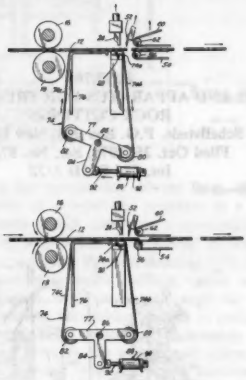
a sealing pad extending transversly to said downstream direction, said advancing means being adapted to intermittently advance the web until a portion thereof overlies said sealing pad while the web is at rest between intermittent advancements thereof;

means for applying tension to said web while the web is at rest;

a blade member extending transversly to the downstream direction over the width of the web and mounted for reciprocal movement onto and away from the web;

means for reciprocating said blade member when the web is at rest to sever the web downstream from said sealing pad;

a heated sealing member extending transversly to said downstream direction over said sealing pad and mounted for reciprocal movement toward and away from said sealing pads;



means for reciprocating said sealing member when the web is at rest to seal the plies of the web at the portion thereof which overlies the sealing member;

the improvement comprising:

a sheet member, at least a portion of which is formed of a non-stick material, located over said sealing pad so as to be interposed between the web and sealing pad; and

means for moving said non-stick sheet member in the downstream direction subsequent to said cutting and sealing steps and while the web is at rest to strip any portion of the sealed portion of the web which may have been bonded thereto during the sealing operation.

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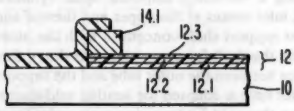
**4,313,782**

## METHOD OF MANUFACTURING SUBMICRON CHANNEL TRANSISTORS

**Joseph C. Sokoloski, East Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Nov. 14, 1979, Ser. No. 94,215**
**Int. Cl.³ H01L *21/308***
**U.S. Cl. 156—628** **5 Claims**




1. A method of manufacturing a semiconductor device, comprising the steps of:

providing a semiconductor body having a boundary surface;

growing a first layer of oxide on the boundary surface;

depositing a layer of silicon nitride on the oxide layer;

growing a second layer of silicon oxide on the nitride layer;

depositing a layer of polycrystalline silicon on the oxide layer;

depositing a layer of apertured masking material on the polycrystalline silicon layer;

etching unmasked portions of the polycrystalline silicon layer to expose the unetched edges of the polycrystalline silicon material under the masking layer;

doping the exposed edges of the unetched polycrystalline silicon layer to form a narrow line of doped polycrystalline silicon in the polycrystalline silicon layer, the doping step forming a doped oxide on the apertured masking material and exposed second oxide layer;

etching the doped oxide, the apertured masking material, and the exposed portions of the plural level insulator layer to expose the doped and undoped portions of the polycrystalline silicon layer and unmasked portions of the silicon body;

forming a second masking layer over the doped and undoped portions of the polycrystalline silicon layer and over the exposed portions of the silicon body;

forming a third apertured masking layer over selected portions of the second masking layer to mask at least the doped portions of the polycrystalline silicon layer and the exposed portions of the silicon body;

etching the exposed portions of the second masking layer to expose only the undoped portions of the polysilicon layer;

selectively etching the undoped portions of the polycrystalline silicon layer;

removing the second and third masking layers to expose the masked portions of the silicon body and the plural insulator layer; and

removing the remaining exposed portions of the plural insulator layer.

2. The method in accordance with claim 1 comprising the further steps of:

providing a substrate of insulative material selected from the group consisting of sapphire, monocrystalline beryllium and spinel; and

forming the silicon body on the insulative substrate.

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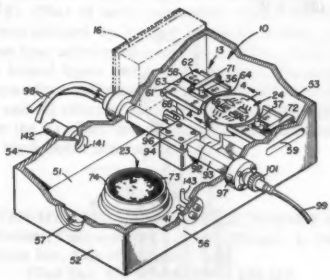
**4,313,783**

## COMPUTER CONTROLLED SYSTEM FOR PROCESSING SEMICONDUCTOR WAFERS

**John T. Davies, El Sobrante, and Richard F. Reichelderfer, Castro Valley, both of Calif., assignors to Branson International Plasma Corporation, Hayward, Calif.**

**Filed May 19, 1980, Ser. No. 151,169**
**Int. Cl.³ C23C *15/00*; H01L *21/306***
**U.S. Cl. 156—643** **26 Claims**



17. In a wafer processing system: means defining a reaction chamber having inlet and outlet ports, load locks operable to provide access to the chamber through the ports while maintaining the chamber in a closed condition, conveyor means for carrying a wafer into and out of the chamber through the load locks, a first electrode mounted in a stationary position within the chamber, a second electrode mounted on a swinging arm for movement between an upright receiving position adjacent to the conveyor means and an inverted wafer processing position above the first electrode, means for securing the wafer to the second electrode for movement therewith, flow control

means for controlling the admission of gas into the chamber, means for energizing the electrodes to ionize the gas to form a plasma for processing the wafer, and exhaust pump for evacuating the chamber, and computer means for controlling operation of the conveyor means, the load locks, the swinging arm the flow control means, the exhaust pump and energization of the electrodes to process the wafer in a predetermined manner.

**19**. In a process for processing a wafer having a generally planar surface in a system comprising a reaction chamber, a conveyor for carrying the wafer into and out of the chamber, a first electrode mounted in a stationary position within the chamber, and a second electrode mounted on a swinging arm for movement between a wafer receiving position and a wafer processing position, the steps of: transporting the wafer into the chamber on the conveyor transferring the wafer from the conveyor to the second electrode, securing the wafer to the second electrode, swinging the arm about an axis parallel to the wafer surface to move the second electrode and the wafer from the receiving position to the processing position, introducing reagent gas into the chamber, and energizing the electrodes to ionize the gas and form a plasma for processing the wafer.

**23**. In a wafer processing system: means defining a reaction chamber, a first electrode mounted in a predetermined position within the chamber, a second electrode mounted on a swinging arm for movement between a wafer receiving position away from the first electrode and a wafer processing position adjacent to the first electrode, conveyor means comprising a walking beam having relatively moveable elongated rails for carrying the wafer to and from the reaction chamber, a plurality of fingers operatively connected to the rails and extending through openings in the second electrode for moving the wafer onto and off of the second electrode when said electrode is in the wafer receiving position, means for securing the wafer to the second electrode for movement with said electrode between the wafer receiving position and the wafer processing position, means for introducing a reagent gas into the chamber, and means for energizing the electrodes to ionize the gas and form a plasma for processing the wafer between the electrodes when the second electrode is in the processing position above the first electrode.

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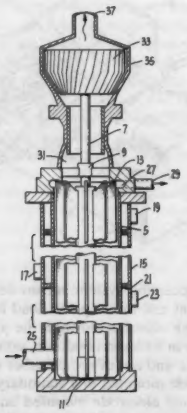
**4,313,784**

## CLIMBING FILM HEAT EXCHANGE APPARATUS

**Floyd C. Haley, Glendora, Calif., assignor to International Refining Equipment, Walnut Creek, Calif.**

**Filed Jun. 17, 1977, Ser. No. 807,734**
**Int. Cl.³ B01D 5/22**
**U.S. Cl. 159—6 W** **5 Claims**




**1**. In a thin film climbing heat treating apparatus of the type having an annular chamber with a shaft having a plurality of flat blades extending radially from said shaft, mounted for rotation within said chamber and requiring means to drive said shaft, the improvement comprising a turbine mounted on said shaft and spaced from said flat blades and means for causing a fluid to flow upwardly through the chamber past said flat blades and then through the turbine thereby causing said turbine to rotate said shaft.

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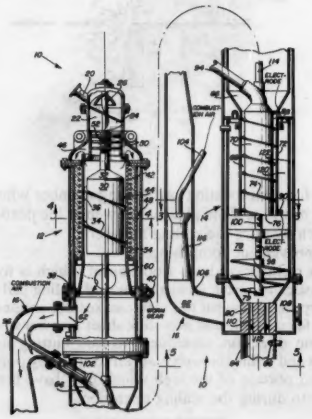
**4,313,785**

## METHOD AND APPARATUS FOR TREATING WASTE ROCK CUTTINGS

**Herman J. Schellstede, P.O. Box 208, New Iberia, La. 70560**

**Filed Oct. 25, 1979, Ser. No. 87,947**
**Int. Cl.³ B01D 1/22**
**U.S. Cl. 159—6 W** **14 Claims**



**1**. A device for removing combustible material from cuttings resulting from well drilling operations, said cuttings consisting of a slurry of underground strata chips, an oil base phase containing hydrocarbons and an aqueous phase, the device comprising a preheating stage wherein said cuttings are preheatable and the major fraction of said hydrocarbons and aqueous phase are removable, a second stage in axial alignment with and receiving material from the preheating stage, said second stage including a vertically disposed open cylindrical outer tube having inlet means at the upper end thereof and outlet means, an inner support shaft concentric with the outer tube, a screw auger on the shaft for conveying said slurry through the annular space between the outer tube and the support shaft wherein the outer tube is adapted for heating said slurry in the annular space so that said hydrocarbons are volatilized and removed from the tube and a residual solid material substantially free of hydrocarbons is removable from the outlet means of the tube, a collecting tube attached to said preheating stage, a blower interposed between the collecting tube and the preheating stage for gathering said volatilized hydrocarbons therefrom, whereby the volatilized hydrocarbons are conducted away from the preheating stage and gas injection means for introducing an oxygen containing gas to said volatilized hydrocarbons in the collecting tube, said injection means being connected to said cylindrical tube for ignition and combustion of the volatilized hydrocarbons, and introduction into said cylindrical tube.

**4,313,786**

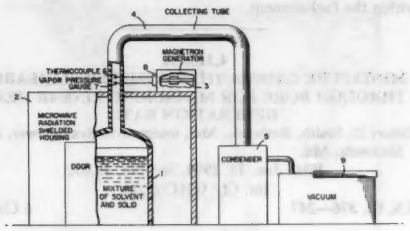
## MAGNETRON SOLVENT RECOVERY SYSTEM

**Jerold B. Smith, P.O. Box 4234, Wilmington, Del. 19807**

**Continuation of Ser. No. 59,599, Jul. 23, 1979, abandoned. This application Oct. 9, 1980, Ser. No. 195,427**

**Int. Cl.³ B01D** *1/00*

**U.S. Cl. 159—22** **2 Claims**




1. An apparatus for recapturing solvent from a liquid comprised of a solution of solvent and polymer or a mixture of solvent and pigment which comprises a nonmetallic holding vessel for retaining said liquid solvent-solid mixture or solution; a microwave radiation shielded housing sufficiently large to accomodate said nonmetallic holding vessel; a collecting tube of nonmetallic material passing through the top of the housing and connecting the holding vessel in sealed relationship to a condenser located outside of the housing and at substantially the same level as the vessel, said connecting tube receiving distilled solvent from the liquid solution or liquid solvent-solid mixture and allows transfer of the distilled solvent from the vessel to the condenser; a magnetron radiation power source contained within said microwave radiation shielded housing and activated exteriorly of the housing by a magnetron generator; a thermocouple and vapor gauge within the collecting tube controlling the operation of the magnetron generator through a switch; the said thermocouple responding to predetermined temperature of the distilled solvent and the gauge responding to an essentially zero solvent vapor pressure, respectively, in the generator control.

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**4,313,787**

## METHOD FOR PREHEATING THE AIR CIRCULATING IN AN INSTALLATION COMPRISING AN EVAPORATOR COUPLED TO A DRYING UNIT

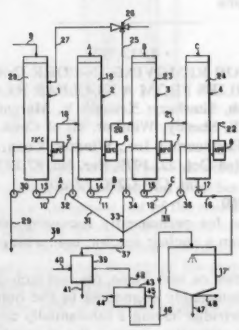
**Jacques J. Ciboit, Paris, and Eric C. Pradines, Versailles, both of France, assignors to Laguilharre S.A., Nanterre, France**

**Filed Jul. 23, 1980, Ser. No. 171,295**

**Claims priority, application Luxembourg, Aug. 3, 1979, 81573**

**Int. Cl.³ B01D** *1/16, 1/26*

**U.S. Cl. 159—48 R** **10 Claims**



1. In a method for concentrating a liquid product into a powdered product wherein said liquid product is treated in a multi-stage evaporator system to form a condensed concentrate product and a condensate and said condensed concentrate product is subsequently dried with hot air to produce a powdered product, the improvement which comprises heating the condensates of said multi-stage evaporator by means of a fluid issuing from said evaporator system to form a hot condensate and bringing said hot condensate issuing from said evaporator system into indirect heat exchange with air to form said hot air, said hot air being used to dry said condensed concentrate product.

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**4,313,788**

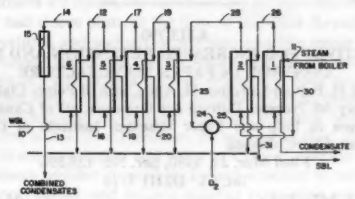
## PROCESS FOR REDUCING OXYGEN CONSUMPTION IN BLACK LIQUOR OXIDATION

**Mark R. Gulley, Emmaus, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.**

**Filed May 12, 1980, Ser. No. 148,630**

**Int. Cl.³ D21C** *11/10, 11/14*

**U.S. Cl. 162—31** **4 Claims**




1. In the oxidation of black liquor obtained from wood pulping with sulfur-containing compounds in a system employing multiple effect evaporation utilizing reverse flow of the liquor up to effect #3 for concentration of such liquor and wherein the heat evolved in the oxidation reaction is utilized to reduce the external heat requirement for concentration of the initially weak black liquor charged to such evaporation system, the improvement which comprises withdrawing the partly concentrated liquor exiting from the #3 effect of said multi-effect evaporation system, oxidizing the withdrawn liquor by contact with a gas stream containing molecular oxygen, with consequent temperature elevation as a result of the heat of the oxidation reaction; introducing the oxidized liquor directly into the #1 effect of such evaporation system wherein it is further concentrated by heating above its boiling point by extraneous heat introduced into said #1 effect, thereby producing a heated liquor and a vapor portion; discharging the heated liquor from said #1 effect into the #2 effect, heating the liquor in said #2 effect by the vapor portion discharged overhead from the #1 effect, and discharging the concentrated and oxidized black liquor from said #2 effect.

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**4,313,789**

## LIGHTWEIGHT REFRACTORY FIBER BURNER BLOCK

**Carl E. Frahme, Canyon Country, Calif., assignor to Industrial Insulations Inc., City of Industry, Calif.**

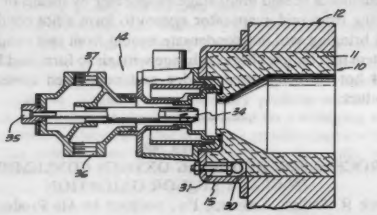
**Filed Dec. 17, 1979, Ser. No. 104,354**

**Int. Cl.³ B29C** *13/00;* **F23C** *5/00*

**U.S. Cl. 162—152** **14 Claims**

1. A lightweight dimensionally-stable, homogeneous burner block adapted for installation about a burner nozzle discharging through a furnace wall into a furnace typically operating at temperatures of 1600° F. and higher, said block being formed essentially of refractory fibers having a length of 3 to 6 inches or more accreted by vacuum deposition from an aqueous slurry of said fibers to a radial thickness of at least three inches about a perforated inner mold member having a surface of revolution, said perforated surface of said tubular burner block conforming to the shape of an imperforate outer cup-shaped

mold member embracing said perforated mold member and having an inlet for said slurry of fibers only at the end thereof remote from said one end wall of said burner block and said



inner and outer mold members being removable from said burner block after the cavity therebetween has been filled with said vacuum deposited fibers.

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4,313,790

## ADDITIVES FOR INCREASED RETENTION AND PITCH CONTROL IN PAPER MANUFACTURE

Robert H. Pelton; Lawrence H. Allen, both of Pointe Claire, and Henry M. Nugent, Dollard des Ormeaux, all of Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Canada

Filed Mar. 31, 1980, Ser. No. 135,596
Int. Cl.³ D21H *3/18*
U.S. Cl. 162—163 15 Claims

1. In a papermaking process utilizing an aqueous wood pulp slurry, the improvement which effects increasing the retention of fines, fillers and pigments while at the same time decreasing the deposition of pitch on the papermaking apparatus which improvement comprises: adding to the slurry an effective amount of a poly(oxyethylene) having a molecular weight of $10^5$ or greater and a kraft lignin product wherein the poly(oxyethylene) is added to the slurry at a rate of between 0.002 and 0.5 percent by weight and the kraft lignin product is added at a rate of between 0.01 and 12 percent by weight both rates being based on the weight of oven-dried pulp.

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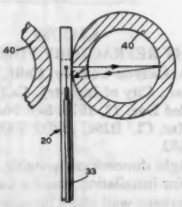
4,313,791

## METHOD FOR LOCATING DEFECTIVE NUCLEAR FUEL ELEMENTS

William E. Lawrie; Robert E. Womack, and Norvell W. White, Jr., all of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed May 6, 1977, Ser. No. 794,507
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—252 10 Claims



1. A method of ultrasonically detecting defective fuel elements of the type used in water cooled reactors, while under water and within a nuclear fuel assembly including a plurality of the fuel elements closely arranged in a transversely spaced array which comprises the steps of inserting an ultrasonic search unit having an ultrasonic transducer element into the spaces between the fuel elements; transversely aligning the transducer element with a fuel element to be examined; energizing the transducer element to transmit an ultrasonic pulse transversely into the wall of the fuel element to be examined; and measuring the ultrasonic echos reflected from the inner wall surface of the fuel element remote from the location of the transducer element to detect the presence of ingressed water within the fuel element.

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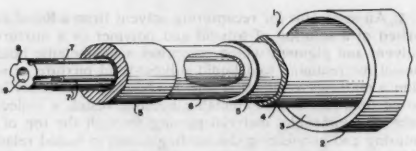
4,313,792

## MINIATURE GAMMA THERMOMETER SLIDEABLE THROUGH BORE FOR MEASURING LINEAR HEAT GENERATION RATE

Robert D. Smith, Bethesda, Md., assignor to Scandpower, Inc., Bethesda, Md.

Filed Jun. 13, 1979, Ser. No. 48,032
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—247 6 Claims



1. In combination with a radioactive environment having a plurality of radiation measuring zones within which sensor devices are mounted for monitoring radiation activity, a traveling probe, means mounted in each of the sensor devices for guiding said probe along paths of movement through each of the zones, and means connected to the probe for calibrating the sensor devices in response to travel of the probe through said zones, the improvement residing in said sensor devices being of the gamma radiation measuring type and said probe including heat sink means for establishing a reference temperature region to which heat flows, elongated heat generating means extending from the heat sink means along each of the paths of movement for establishing a heat flow path to the heat sink means, means for thermally isolating the heat generating means from the sensor device, thermocouple junction means for sensing differential temperatures between the heat sink means and the heat generating means, signal conducting means connected to the junction means for transmitting signals therefrom to the calibrating means externally of the radioactive environment to adjust calculation of power from signal outputs of the sensor devices, and an elongated flexible sheath thermally connected to the heat sink means and protectively enclosing the signal conducting means.

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4,313,793

## MACHINE FOR REMOVING IN-CORE INSTRUMENT ASSEMBLIES FROM A NUCLEAR REACTOR

Ralph H. Klumb, Simsbury; Kenneth V. Margotta, Rockville, and Divakar S. Shendy, Windsor, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 22, 1979, Ser. No. 87,197
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—260 9 Claims

1. A machine for permanently removing stiff instrument guide tubing from a nuclear reactor, comprising:

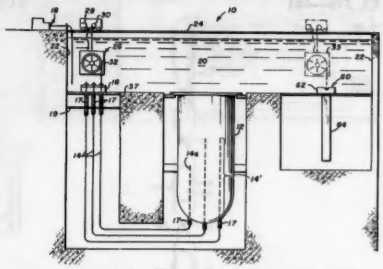
(a) a frame;

(b) a reel carried on said frame, the reel including a circular cartridge detachably connected to the outer rim of the reel, the cartridge having a substantially continuous helical groove extending around the circumference of the cartridge, the groove having an effective diameter approximately equal to that of the outer diameter of the tube;

(c) means for capturing one end of the tube on the reel;

(d) means for selectively driving the reel relative to the frame in either circumferential direction;

(e) a plurality of cam rollers carried by said frame and closely spaced around the circumference of said reel, said rollers being mounted in fixed relationship to the reel,



whereby the cam rollers provide sufficient friction between the groove and the tube so that the tube can be tightly wound onto or wound off from the reel;

(f) means carried by the frame adjacent to the reel for straightening the tube as it winds onto or off of the reel.

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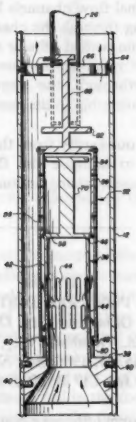
**4,313,794**

## SELF-ACTUATING AND LOCKING CONTROL FOR NUCLEAR REACTOR

**Dong K. Chung, Chatsworth, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Feb. 15, 1979, Ser. No. 12,275**
**Int. Cl.³ G21C *7/06***
**U.S. Cl. 376—352** **10 Claims**



4. In a nuclear reactor of the type which includes a plurality of laterally displaced vertical neutron absorber column assemblies located in and extending out of the reactor core, each of the column assemblies containing a plurality of neutron absorbing elements which, during normal operation of the reactor, are hydraulically supported outside of the core of the reactor, the improvement comprising:

a self-actuating, self-locking flow cutoff valve, said valve including:

a substantially vertical elongated housing having opposite ends for the flow of said fluid therethrough;

an apertured plate located in said housing, the apertures providing fluid flow from one end of said housing to the other end;

a substantially vertical elongated nozzle member having top and bottom ends located in said housing and fixed to said housing, an opening in the bottom end of said nozzle member for receiving said fluid, apertures adjacent the top end for discharging said fluid, and two sealing means comprising radially outwardly and downwardly extending sealing surfaces, one located above and the other below said apertures;

an elongated flow cutoff sleeve located in said housing having walls surrounding said nozzle, a fluid flow opening adjacent an upper end of said sleeve, two sealing means comprising radially inwardly and upwardly extending sealing surfaces affixed to said sleeve, one below said flow opening and one adjacent a lower end of said sleeve, said sleeve being moveable between an upper open position wherein the apertures in said nozzle member are substantially unobstructed for the flow of fluid therethrough and a closed position wherein said sleeve and nozzle sealing surfaces are mated, the mated sealing surfaces and the wall of said sleeve obstruct the flow of said fluid through said apertures, and said nozzle and sleeve sealing means cooperatively acting together to further provide for the exposure of a greater area for fluid pressure to exert force in a downward direction than is exposed for fluid pressure to exert force in an upward direction whereby once said valve is in a closed position, an increase in fluid pressure will act to maintain said valve in a closed position; and

a balance member located above and attached to said flow cutoff sleeve, said balance member contacting said apertured plate when said sleeve is in an open position and obstructing the flow of fluid through a predetermined flow area of the apertures in said apertured plate for producing a pressure drop across the apertured plate and said balance member, said pressure drop being just sufficient to support said balance member and flow cutoff sleeve at a predetermined minimum fluid flow whereby, when said fluid flow drops below the predetermined flow, the pressure drop across the balance member will be insufficient to maintain said flow cutoff sleeve in the open position and it will move under the influence of gravity to a closed position.

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**4,313,795**

## NUCLEAR POWER PLANT WITH ON-SITE STORAGE CAPABILITIES

**Hector A. Dauvergne, P.O. Box 884, San Leandro, Calif. 94577**

**Filed Mar. 10, 1980, Ser. No. 129,029**
**Int. Cl.³ G21C *19/20***
**U.S. Cl. 376—280** **11 Claims**

1. A nuclear power plant comprising:

a. a containment vessel having:

a first portion containing a nuclear reactor core and a molten core-coolant, heat transfer medium, said reactor core and heat transfer medium being radioactively contaminating,

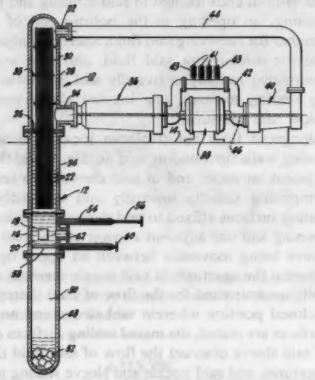
a second portion containing a power generating drive medium

means for separating said first portion of said containment vessel from said second portion,

wherein said second portion is isolated from radioactive contamination from said reactor core and said heat transfer medium in said first portion; and

solid state, heat transfer conductors having a first conductor portion in contact with said heat transfer medium of said first portion of said containment vessel and a second conductor portion in contact with said drive medium in said second portion of said containment vessel, wherein said heat transfer conductors remain in a solid state during transfer of heat by thermal conduction

from said first portion of said containment vessel to said second portion of said containment vessel; and



b. power generating means connected to said containment vessel for generating electric power by use of said drive medium.

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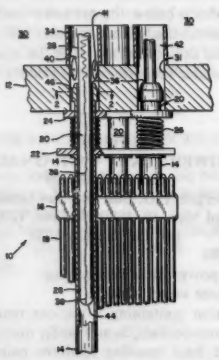
4,313,796

## GUIDE POST MODIFICATION FOR NUCLEAR FUEL ASSEMBLY

Paul Buettiker, Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 30, 1979, Ser. No. 61,583
Int. Cl.³ G21C 3/32, 15/00
U.S. Cl. 376—353 6 Claims



1. A nuclear fuel assembly for a water-cooled nuclear reactor having a reciprocating cylindrical nuclear control rod, comprising:

a plurality of vertically oriented fuel elements;

a cylindrical guide tube fixedly supported parallel to and coextensive with said fuel elements, for telescopingly receiving the control rod from above and for carrying an upward flow of coolant from below wherein the ratio of the minimum inner diameter of the guide tube to the control rod outer diameter is no greater than about 1.5, said guide tube having a cylindrical inner wall; and

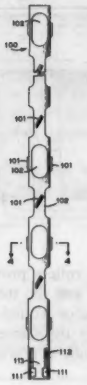
a hollow control rod guide post extending from the upper end of the guide tube and in axial alignment therewith, the post having an inner wall forming a convex polygon.

4,313,797

## GUIDE TUBE SLEEVE

Douglas J. Attix, Forest, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 19, 1979, Ser. No. 77,257
Int. Cl.³ G21C 3/30
U.S. Cl. 376—441 5 Claims



1. A fuel assembly for a nuclear reactor comprising:

a. a plurality of longitudinally extending parallel members including fuel bearing parallel members and non-fuel bearing parallel members;

b. at least one spacer grid disposed transversely across the parallel members, said grid having a plurality of cellular voids for accommodating the extension of members therethrough, said grid keeping adjacent members apart so as to create longitudinal flow channels between members;

c. a coolant passing through the channels;

d. a plurality of thin-walled tubular sleeves attached to the walls of cellular voids having non-fuel bearing members extending therethrough, the sleeves being disposed in surrounding relationship to the non-fuel bearing members; and

e. tabs projecting outwardly from the sleeves into adjacent flow channels to increase the flow of coolant therethrough and cause a mixing action in the coolant.

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4,313,798

## MICRO-WAVE POWERED DISTILLATION UNIT

Bert R. Myers, Jr., Oklahoma City, Okla., assignor to Lakehurst Galleries, Ltd., Oklahoma City, Okla.

Filed Jun. 17, 1980, Ser. No. 160,378
Int. Cl.³ B01D 3/02
U.S. Cl. 202—234 7 Claims

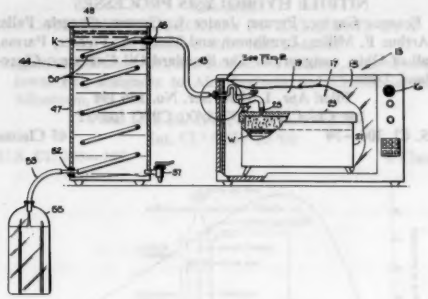
1. A distillation system utilizing a conventional, kitchen-type micro-wave oven to supply energy for distillation of fluids comprising:

(a) a conventional, kitchen-type micro-wave oven;

(b) a boiler means dimensioned and designed to fit within the micro-wave oven;

(c) tubular prevention means adapted and dimensioned to pass through a wall of the micro-wave oven, and adapted for quick connection to and disconnection from a connection means to the boiler means and a connection means to the condensing means and dimensioned and designed for preventing the passage of micro-wave energy to the exterior of the micro-wave unit while conducting vapors from the boiler means to the condensing means;

(d) condensing means having a connection means adapted for quick connection to and disconnection from the pre-



vention means, a heat exchange relationship with a cooling means, and a condensed fluid outlet.

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4,313,799

## OXYGEN SENSOR AND METHOD FOR DETERMINING THE OXYGEN ACTIVITY IN MOLTEN GLASS

Richard A. Perkins, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 4, 1980, Ser. No. 137,163
Int. Cl.³ G01N 27/58
U.S. Cl. 204—1 T 8 Claims

1. An oxygen sensor for determining the oxygen in molten glass comprising:

a solid electrolyte;

a solid, first electrode on the inside of the electrolyte adapted to be exposed to a reference gas or solid;

a solid, second electrode on the outside of the electrolyte adapted to be exposed to molten glass; and

electrical conducting means connected to the electrodes for conducting an electrical signal generated by movement of oxygen ions through the solid electrolyte, wherein the second electrode is platinum foil in the form of a skirt.

7. A method for determining the oxygen activity in molten glass comprising the steps of:

(a) adapting an oxygen sensor to be exposed to molten glass;

(b) inserting the oxgyen sensor in molten glass wherein the oxygen sensor comprises,

a solid electrolyte,

a solid, first electrode on the inside of the electrolyte adapted to be exposed to a reference gas or solid,

a solid, second electrode of platinum foil on the outside of the electrolyte, and

electrical conducting means connected to the electrodes for conducting an electrical signal generated by movement of oxygen ions through the solid electrolyte; and

(c) monitoring the oxygen activity in the molten glass, wherein the adapting is done by the platinum foil being in the form of a skirt.

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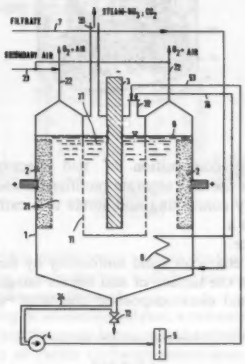
4,313,800

## METHOD OF RECONDITIONING RADIOACTIVE FILTRATE

Thomas Sondermann, Kahl, Fed. Rep. of Germany, assignor to Reaktor-Brennelement Union GmbH, Hanau, Fed. Rep. of Germany

Filed Dec. 31, 1979, Ser. No. 108,408
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1979, 2901067
Int. Cl.³ C25B 1/00; C01G 43/00
U.S. Cl. 204—1.5 8 Claims



1. Method for reconditioning ammonium nitrate-containing radioactive filtrates which are aqueous solutions containing $NH_4$, $NO_3$, $CO_3$ and U and may also contain Pu, which comprises maintaining an electrolysis cell having an anode chamber and a cathode chamber and ammonium nitrate solution as electrolyte, decomposing water to oxygen and hydrogen in the electrolysis cell and also reducing nitrogen oxide in the cell with the hydrogen to produce $NH_3$, maintaining a boiling ammonium nitrate solution in the cathode chamber of the electrolysis cell, feeding said radioactive filtrate into the cathode chamber wherein this filtrate is brought to the boiling temperature with the assistance of the joulean heat of the electrolysis current, releasing gaseous $CO_2$ and $NH_3$ together with steam from the boiling ammonium nitrate solution in the cathode chamber, separately releasing oxygen from the anode chamber, converting soluble uranium compounds and plutonium if present in the ammonium nitrate solution to a precipitate containing uranium and plutonium if present suspended in the ammonium nitrate solution, recirculating said ammonium nitrate solution containing suspended precipitate through filter means to separate the precipitate, and also electrically precipitating dissolved uranium at the cathode.

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4,313,801

## PROCESS FOR FABRICATING COMPUTER PRINTER CHARACTER BANDS BY ELECTRODEPOSITION

Robert J. Walter, 418 Kevin St., Thousand Oaks, Calif. 91360, and Kam C. Wong, 6540 Franrivers Ave., Canoga Park, Calif. 91307

Filed Oct. 6, 1980, Ser. No. 194,549
Int. Cl.³ C25D 1/02
U.S. Cl. 204—9 10 Claims

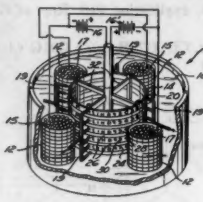
1. A process for fabricating character bands used in computer printers, comprises the steps of:

electrodepositing a metal alloy selected from the group consisting of nickel cobalt, nickel iron, nickel mangenese, nickel cobalt iron, nickel cobalt mangenese, and nickel

iron mangenese onto a mandrel which comprises at least one mirror image band and wherein composition control of said electrodeposited nickel alloy is effected by

preparing an electrolyte solution containing a predetermined amount of the preselected metal ions;

inserting into said electrolyte solution an anode comprising at least one titanium basket for each metal in said nickel alloy;



controlling composition of said electrolyte solution through use of a separate rectifier for each metal; and

electrically connecting said anode to a cathodic mandrel through a

power source;

maintaining character band uniformity by flowing electrolyte across the surface of said mirror image band; and

separating said electrodeposited character band from said mandrel.

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**4,313,802**

## METHOD OF PLATING STEEL STRIP WITH NICKEL-ZINC ALLOY

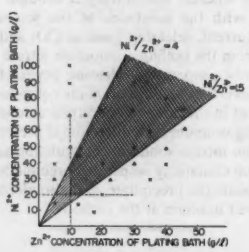
**Atsuyoshi Shibuya, Kyoto, and Tatsuo Kurimoto, Osaka, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan**

**Filed Feb. 5, 1980, Ser. No. 118,962**

**Claims priority, application Japan, Feb. 15, 1979, 54-16927; Feb. 15, 1979, 54-16928; Dec. 18, 1979, 54-165343**

**Int. Cl.³ C25D *3/56, 5/04***

**U.S. Cl. 204—28** **17 Claims**




1. A method of plating steel strip at a current density higher than 5 A/dm² with a zinc-nickel alloy which comprises

continuously passing the steel strip at a predetermined feeding rate through an electrolyte plating bath at a pH of 1.0–4.5 and a temperature of 40°–70° C. in which the concentration of $Ni^{2+}$ is maintained at a level of 20 g/l or more and the concentration of $Zn^{2+}$ at a level of 10 g/l or more and simultaneously the molar ratio of $Ni^{2+}/Zn^{2+}$ is restricted to a range from 1.5 to 4.0,

with the relative speed of passage of the steel strip with respect to the electrolyte being maintained at 10–200 m/min. by flowing the electrolyte counter-current to the direction of travel of the steel strip.

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**4,313,803**

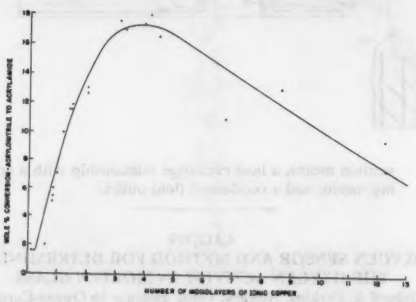
## ELECTROCHEMICAL MAINTENANCE OF OPTIMUM CATALYTIC ACTIVITY IN COPPER-CATALYZED NITRILE HYDROLYSIS PROCESSES

**V. Frances Gaylor, Parma; Janice L. Greene, Chagrin Falls; Arthur F. Miller, Lyndhurst, and Marty A. Pichler, Parma, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio**

**Filed Apr. 1, 1980, Ser. No. 136,191**

**Int. Cl.³ C25B *1/00, 3/00;* C07C *103/12***

**U.S. Cl. 204—74** **45 Claims**




1. A process for maintaining the activity of a copper-containing catalyst useful in producing amides from nitriles by hydrolysis comprising:

utilizing said copper-containing catalyst as at least one electrode of an electrochemical reactor containing a solution comprising nitrile and water,

applying a direct current to the reactor at least intermittently, and

controlling the direct current to maintain at least a partial surface coverage of at least an average thickness of about 0.75 monolayers of ionic copper on the catalyst.

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**4,313,804**

## PROCESS FOR PREPARING CERIC SULPHATE

**Klaus H. Oehr, Surrey, Canada, assignor to B.C. Reasearch Council, Vancouver, Canada**

**Filed Oct. 21, 1980, Ser. No. 199,351**

**Int. Cl.³ C25B *1/22***

**U.S. Cl. 204—93** **8 Claims**

1. A process for preparing ceric sulphate in solution that comprises electrolyzing an at least saturated solution of cerous sulphate at an anodic current density in the range 100 to 200 mamp/cm², high cathode current density and with vigorous agitation in the presence of dilute sulphuric acid.

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**4,313,805**

## CHLORINE CELL CATHOLYTE SERIES FLOW

**Harry S. Burney, Clute, and Bobby R. Ezzell, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Mar. 3, 1980, Ser. No. 126,278**

**Int. Cl.³ C25B *1/16, 9/00, 13/08***

**U.S. Cl. 204—98** **11 Claims**

1. A method for improving the electrical potential of a plurality of electrolytic chlor-alkali cells wherein the cells contain catholyte portions separated from anolyte portions by the use of fluoropolymer membranes, and wherein catholyte liquor flows from catholyte portion to catholyte portion in series, gaining an caustic strength as it flows from cell-to-cell, the strength of the caustic leaving the last cell of the series being greater than about 18%, the improvement comprising,

employing as fluoropolymer membranes thin sheets of fluoropolymers containing functional pendant groups substituted in a manner so as to render the fluoropolymer more hydrophilic than polytetrafluoroethylene and less hydro-

philic than fluoropolymers containing sulfonic acid groups attached to pendant perfluorocarbon groups.

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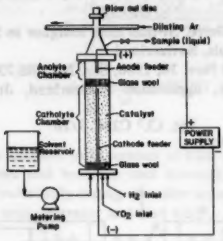
**4,313,806**

## CATHODIC PROTECTION OF CATALYSTS IN A CORROSIVE ENVIRONMENT

**Augustine I. Dalton, Jr., and Ronald W. Skinner, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**

**Filed Oct. 10, 1980, Ser. No. 195,815**
**Int. Cl.³ C23F *13/00***
**U.S. Cl. 204—147** **8 Claims**




1. A process for preventing dissolution of a Group VIII noble metal catalyst from a conductive or semiconductive carrier in a corrosive or oxidatively active liquid environment, comprising polarizing the Group VIII noble metal surface on the conductive or semiconductive carrier so as to render the polarized Group VIII noble metal surface cathodic with respect to an anode placed in a reactor containing the corrosive or oxidatively active liquid environment.

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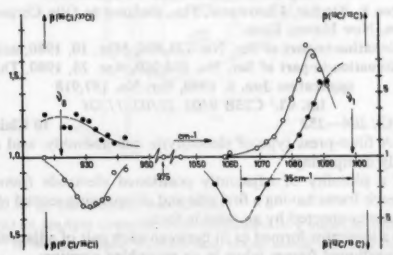
**4,313,807**

## METHOD FOR ENRICHING A GASEOUS ISOTOPIC MIXTURE WITH AT LEAST ONE ISOTOPE

**Marcel N. de Mevergnies, and Paul Fettweis, both of Mol, Belgium, assignors to "Studiecentrum voor Kernenergie," "S.C.K.", Schaerbeek, Belgium**

**Filed Apr. 3, 1979, Ser. No. 26,507**
**Claims priority, application Belgium, Apr. 3, 1978, 186519; Feb. 6, 1979, 193306**
**Int. Cl.³ B01D *59/00***
**U.S. Cl. 204—157.1 R** **5 Claims**




1. Method for enriching a gas-like isotopic mixture with at least one isotope, which comprises irradiating a mixture of $CF_2Cl_2$ and $O_2$ by means of a pulsed and focalised laser beam at an optical frequency corresponding to a wave number lying in one of the following bands: 920–945 $cm^{-1}$ and/or 1080–1095 $cm^{-1}$, so as to form $COF_2$ and $Cl_2$ as reaction products, separating the residual $CF_2Cl_2$ from these reaction products, so as to obtain, for an irradiation in the band 920–945 $cm^{-1}$, residual $CF_2Cl_2$ enriched with $^{37}Cl$ and, for an irradiation in the band 1080–1095 $cm^{-1}$, residual $CF_2Cl_2$ enriched with $^{35}Cl$ and $^{13}C$.

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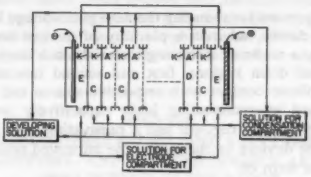
**4,313,808**

## ELECTRODIALYZER AND METHOD OF REGENERATING WASTE PHOTOGRAPHIC PROCESSING SOLUTION

**Noboru Idemoto, Tokuyama; Minoru Yamada, Minami-ashigara; Mamoru Tashiro, Minami-ashigara, and Sachio Matsushita, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Jun. 16, 1980, Ser. No. 159,567**
**Claims priority, application Japan, Jun. 15, 1979, 54-76158**
**Int. Cl.³ B01D *13/02***
**U.S. Cl. 204—180 P** **7 Claims**




1. A method for regenerating a waste photographic processing solution by electrodialysis utilizing ion exchange membranes comprising the steps of:

(a) positioning in an electrodialyzer, a cathode and an anode;

(b) partitioning the space between said cathode and anode by a plurality of cation exchange membranes and anion exchange membranes alternately arranged in such a way that a farthest membrane from the anode is a cation exchange membrane and a farthest membrane from the cathode is an anion exchange membrane, thus forming a plurality of desalting compartments and an equal number of concentrating compartments alternately arranged in such a way that a farthest compartment from the anode is a desalting compartment and a farthest compartment from the cathode is a concentrating compartment, each of said desalting compartments being partitioned by one of said cation exchange membranes on the cathode side and by one of said anion exchange membranes on the anode side thereof, and each of said concentrating compartments being partitioned by one of said anion exchange membranes on the cathode side and by one of said cation exchange membranes on the anode side thereof;

(c) positioning a cation exchange membrane between the cathode and the farthest cation exchange membrane from the anode to form a concentrating compartment partitioned by cation exchange membranes on both saides thereof and a cathode compartment;

(d) positioning a cation exchange membrane between the farthest anion exchange membrane from the cathode and the anode to form a concentrating compartment partitioned by one of said anion exchange membrane and said cation exchange membrane and and anode compartment;

(e) providing a waste solution to be regenerated by each desalting compartment and circulating said waste solution therethrough;

(f) providing an electrolyte solution to each of said concentrating compartments and circulating said electrolyte solution therethrough;

(g) providing a common electrolyte solution to said cathode compartment and anode compartment and circulating said electrolyte solution therethrough; and

(h) passing a direct electric current across the alternating membranes and compartments.

**4,313,809**

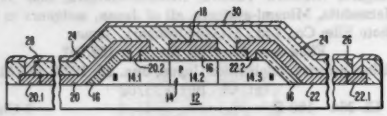
## METHOD OF REDUCING EDGE CURRENT LEAKAGE IN N CHANNEL SILICON-ON-SAPPHIRE DEVICES

**Carl W. Benyon, Jr., Trenton, and John J. O'Neill, Jr., Belle Mead, both of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Oct. 15, 1980, Ser. No. 197,286**

**Int. Cl.³ C23C *15/00***

**U.S. Cl. 204—192 C** **6 Claims**




1. In a process for reducing the zero gate voltage leakage of an MOS device, wherein a plurality of devices are initially formed on a wafer of insulating material, each device having source and drain regions, first and second interconnecting leads in ohmic contact with respective source and drain regions, third interconnecting leads capacitively coupled to respective channel regions, and a passivating layer covering each of the devices on the wafer, the improved process comprising the steps of:

sputtering a layer of metal on the passivating layer completely covering each device on the wafer; and

removing the sputtered layer.

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**4,313,810**

## OXYGEN CONCENTRATION SENSING APPARATUS

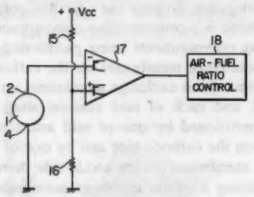
**Hitoshi Niwa, Anjo; Naoto Miwa, Tsushima; Masatoshi Suzuki, Kariya, and Masami Ouki, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Jun. 27, 1979, Ser. No. 53,181**

**Claims priority, application Japan, Jul. 7, 1978, 53/83343**

**Int. Cl.³ G01N *27/58***

**U.S. Cl. 204—195 S** **5 Claims**




1. An oxygen concentration sensing apparatus comprising:

a block of an oxygen-ion conductive solid electrolyte for exposure wholly to a stream of gases containing oxygen whose concentration is to be measured,

a first electrode and a second electrode disposed opposite to each other with said solid electrolyte block interposed therebetween,

said first electrode being made of a catalytic metal capable of exerting a catalytic action on gases containing oxygen, at least a portion of said first electrode being exposed on one of the faces of said solid electrolyte block,

said second electrode being porous and made of a catalytic metal capable of exerting a catalytic action on gases containing oxygen,

cover means covering the exposed portion of said first electrode and being a layer of an electrical insulating heatresistive material having a plurality of communication pores, and

an electric circuit supplying continuously an electric current in a direction from said first electrode toward said second electrode during the period of measurement of the oxygen concentration, wherein said electric circuit comprises

means for generating a reference voltage, and

comparator means having first and second input terminals connected respectively to said first electrode and said generating means being constructed to cause a constant current to flow into said solid electrolyte block from said first terminal of said comparator means via said first electrode.

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**4,313,811**

## ARRANGEMENT OF BUSBARS FOR ELECTROLYTIC CELLS

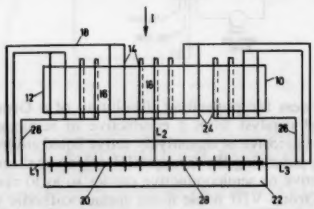
**Jean M. Blanc, Sierre, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland**

**Filed Nov. 10, 1980, Ser. No. 205,735**

**Claims priority, application Switzerland, Jun. 23, 1980, 4786/80**

**Int. Cl.³ C25C *3/16***

**U.S. Cl. 204—243 M** **13 Claims**




1. In a series of electrolytic cells provided with a plurality of cathode bars an arrangement of a plurality of busbars for conducting the direct current from the cathode bar ends of a transversely disposed cell to the anode beam of the next cell in the series wherein a portion of said plurality of busbars pass under the cell the improvement which comprises connecting the cathode bar ends which lie upstream of the current flow in the cell to said plurality of busbars and alternately passing said plurality of busbars under the cell and around the cell.

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**4,313,812**

## MEMBRANE ELECTRODE PACK CELLS DESIGNED FOR MEDIUM PRESSURE OPERATION

**Morton S. Kircher, Clearwater, Fla., assignor to Olin Corporation, New Haven, Conn.**

**Continuation-in-part of Ser. No. 128,684, Mar. 10, 1980, and a continuation-in-part of Ser. No. 143,969, Apr. 25, 1980. This application Jun. 6, 1980, Ser. No. 157,918**

**Int. Cl.³ C25B *9/00, 13/00, 11/04***

**U.S. Cl. 204—253** **10 Claims**

1. A filter-press type of electrolytic cell assembly, said assembly comprising:

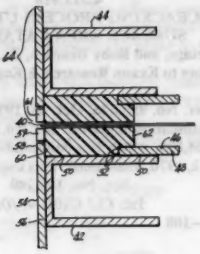
(a) a plurality of adjacently positioned electrode frames, each frame having a first side and an opposing second side interconnected by an outside face;

(b) a separator formed to fit between each pair of adjacently positioned frames when in an assembled position;

(c) at least a first and an opposing second vertical planar layer of electrode material attached to each frame conforming in shape to said frames positioned parallel but spaced apart and having smaller external dimensions than said frames, each of said first and second layers being affixed to and overlapping on a portion of said first side and said second side respectively of each of said frames so as to form an outwardly facing shoulder on at least one of each side of each of said frames;

(d) a gasket retainer member affixed to said outside face of at least one of said plurality of frames and projecting beyond

at least one of said first side or said second side and toward at least one of the adjacently positioned frames so as to form an inwardly facing shoulder on at least one of said sides of said frame; and



(e) a gasket adapted to fit against at least one side of one of said frames and between said inwardly facing shoulder and said outwardly facing shoulder so as to seal the space between said separator and said side.

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**4,313,813**

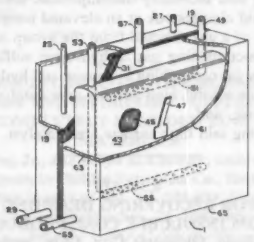
## FIXED BED OXYGEN DEPOLARIZED CATHODE CHLOR-ALKALI CELL

**Harlan B. Johnson, Rittman, and Ronald D. Chamberlin, Wadsworth, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Division of Ser. No. 82,841, Oct. 9, 1979, Pat. No. 4,244,793. This application Jun. 26, 1980, Ser. No. 163,120**

**Int. Cl.³ C25B** *9/00, 11/03, 11/06, 11/12*

**U.S. Cl. 204—263** **5 Claims**



1. In an electrolytic cell having

(a) an anolyte compartment fabricated of a material resistant to concentrated, chlorinated, alkali metal chloride brines;

(b) an anode in said anolyte compartment;

(c) a catholyte compartment fabricated of a material resistant to concentrated, alkali metal hydroxide solutions;

(d) cathode means comprising porous particles having areas of $HO_2$—disproportionation catalyst;

(e) means for feeding an oxidant to said catholyte compartment; and

(f) an ion permeable barrier interposed between said anode and said cathode means;

the improvement wherein said $HO_2^-$ disproportionation catalyst is $LaCoO_3$.

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**4,313,814**

## ELECTRODE FOR ELECTROLYSIS AND MANUFACTURE THEREOF

**Shunjiro Saito; Akio Nakamura, and Makoto Kobayashi, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan**

**Filed Dec. 22, 1977, Ser. No. 863,425**

**Claims priority, application Japan, Jan. 27, 1977, 52-8086**

**Int. Cl.³ C25B** *11/08*

**U.S. Cl. 204—290 F** **14 Claims**

1. An electrode for electrolysis, which comprises:

a conductive metal substrate of titanium, zirconium or tantalum having coated thereon a layer consisting of a combination of palladium oxide and platinum metal or a combination of palladium oxide and Pt-Pd alloy wherein on a basis of 100 mole percent palladium and platinum metal in said coating, palladium constitutes 99 to 5 mole percent of the total noble metal content and platinum metal constitutes 1 to 95 mole percent of the total noble metal content and wherein at least 25 weight percent of the palladium component of said coating exists in the form of palladium oxide.

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**4,313,815**

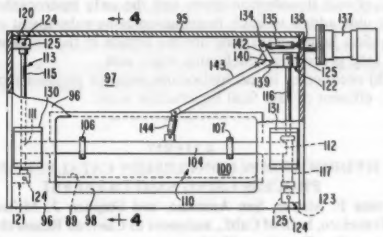
## SPUTTER-COATING SYSTEM, AND VACCUUM VALVE, TRANSPORT, AND SPUTTER SOURCE ARRAY ARRANGEMENTS THEREFOR

**Walter E. Graves, Jr., San Jose; Donald Boys, Cupertino, and Frederick T. Turner, Sunnyvale, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.**

**Filed Apr. 7, 1978, Ser. No. 894,287**

**Int. Cl.³ C23C** *15/00*

**U.S. Cl. 204—298** **9 Claims**



1. High throughput sputter coating system for coating workpieces carried by an internal chamber conveyer which has a width several times the diameter of an individual sputtering source, and capable of interfacing with input and output conveyor means and air locks, comprising:

a vacuum processing chamber having an entrance opening and an exit opening at opposite ends thereof;

internal chamber conveyor means for carrying workpieces, said conveyor means extending between said entrance and exit openings;

a first plurality of sputtering sources mounted within said vacuum processing chamber above said internal conveyor means and extending in a side-by-side array transversely to the direction of said internal conveyor means;

first and second isolation valve means sealing said entrance and exit openings of said processing chamber, each of said isolation valves including

a wide plate-like gate of width at least that of said internal conveyor means, and sealingly overlappable with the corresponding chamber opening,

an elongated member affixed transversely across said gate and extending beyond the edges of said gate, means for supporting said gate at the ends of said elongated member, said means adapted to permit upward and downward movement in a first direction parallel to said chamber

opening and limited inward and outward movement in a second direction normal to said chamber opening,

means acting at the ends of said elongated member for applying closure force to said gate inwardly in said second direction toward said chamber opening, means connected to said elongated member for moving said gate up and down along said means supporting said gate; whereby said system may interface with input and output conveyors and air locks to accept workpieces which are advanced at high throughput rates through said valve means and into said chamber.

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4,313,816

## STAGED TEMPERATURE COAL CONVERSION PROCESS

Lavanga R. Veluswamy, Houston, and Peter S. Maa, Baytown, both of Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 25, 1980, Ser. No. 180,543
Int. Cl.[3] C10G *1/00, 1/06*
U.S. Cl. 208—10 15 Claims

1. A process for converting coal or similar liquefiable carbonaceous solids into lower molecular weight liquid hydrocarbons which comprises:

(a) contacting said carbonaceous solids with molecular hydrogen in the absence of externally added hydrocarbon liquids under liquefaction conditions during sequential residence in two or more liquefaction zones arranged in series and operated such that (i) the temperature in each zone increases from the first to the final zone of the series and (ii) the total of the solids residence times in all except the final zone of the series is greater than about 40 minutes, wherein said carbonaceous solids are partially converted into lower molecular weight liquid hydrocarbons in each of said liquefaction zones and the only hydrocarbon liquids added to each liquefaction zone subsequent to said first liquefaction zone are the liquids in the effluent from the preceding liquefaction zone; and

(b) recovering liquid hydrocarbonaceous product from the effluent of said final liquefaction zone.

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4,313,817

## HYDROCARBON CONVERSION CATALYST AND PROCESS USING SAID CATALYST

Jerome F. Mayer, San Anselmo, and Stephen J. Miller, San Francisco, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 21,751, Mar. 19, 1979. This application Jun. 16, 1980, Ser. No. 160,033
Int. Cl.[3] C10G *45/08, 47/20, 65/12*
U.S. Cl. 208—89 22 Claims

14. A hydrocracking process comprising contacting a hydrocarbon feed containing substantial amounts of materials boiling above 95° C., said feed having a content of nitrogen-containing impurities, calculated as nitrogen, which is below about 10 ppmw, in a reaction zone with hydrogen and a catalyst under hydrocracking conditions wherein said catalyst comprises a composite containing:

(A) A porous amorphous matrix selected from the group consisting of alumina-silica, alumina-silica-titania and alumina-silica-zirconia polygels, said polygels having an alumina-silica weight ratio in the range of from about 0.2–20 to 1 respectively;

(B) A hydrogenation component of (1) nickel in an amount, calculated as metal, in the range of from about 1 to 10 weight percent of said matrix, and (2) tungsten, in an amount calculated as metal, in the range of from about 5 to 25 weight percent of said matrix, said hydrogenation component being in the form of metal or oxide or sulfide or any combination thereof and (3) dispersed through said matrix; and

(C) A finely divided crystalline aluminosilicate zeolite component of the ZSM-5-type substantially in the ammonium or hydrogen form, said zeolite being (1) substantially free of hydrogenation component and (2) dispersed through said matrix.

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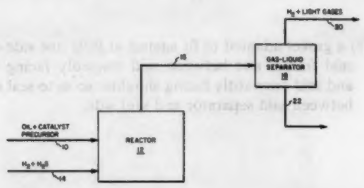
4,313,818

## HYDROCRACKING PROCESS UTILIZING HIGH SURFACE AREA CATALYSTS

Clyde L. Aldridge, and Roby Bearden, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 955,526, Oct. 30, 1978, Pat. No. 4,244,839, which is a continuation-in-part of Ser. No. 847,898, Nov. 2, 1977, Pat. No. 4,134,825, which is a continuation-in-part of Ser. No. 702,227, Jul. 2, 1976, abandoned. This application Dec. 19, 1979, Ser. No. 105,249
Int. Cl.[3] C10G *47/06*
U.S. Cl. 208—108 9 Claims




1. A hydrocracking process which comprises contacting a hydrocarbonaceous oil feed in the presence of added hydrogen at hydrocracking conditions with a high surface area catalyst prepared by the steps which comprise:

(a) adding to a hydrocarbon oil chargestock having a Conradson carbon content up to about 50 weight percent, a thermally decomposable metal compound in an amount sufficient to provide a ratio of atoms of oil chargestock Conradson carbon to atoms of metal constituent of said thermally decomposable metal compound of less than about 750 to 1, said metal constituent being selected from the group consisting of Group II, Group III, Group IV, Group V, Group VIB, Group VIIB and Group VIII of the Periodic Table of Elements and mixtures thereof;

(b) heating said thermally decomposable metal compound within said chargestock at an elevated temperature in the presence of a gas selected from the group consisting of a hydrogen-containing gas, a hydrogen sulfide-containing gas, and a gas comprising hydrogen and hydrogen sulfide, to produce a solid high surface area catalyst within said chargestock, and

(c) recovering said high surface area catalyst.

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4,313,819

## PROCESS FOR RECOVERING DEASHING SOLVENT FROM INSOLUBLE COAL PRODUCTS

Theodore A. Rado, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed May 22, 1980, Ser. No. 152,422
Int. Cl.[3] C10G *1/00*
U.S. Cl. 208—177 10 Claims

1. A process comprising:

providing coal liquefaction products comprising soluble coal products and insoluble coal products;

contacting said coal liquefaction products with a deashing solvent to provide a feed mixture;

introducing said feed mixture into a separation zone maintained at an elevated temperature and pressure level to effect a separation of said feed mixture into a light phase and a heavy phase comprising insoluble coal products and deashing solvent;

contacting said heavy phase with a recycled cool slurry comprising insoluble coal products and water in a suffi-

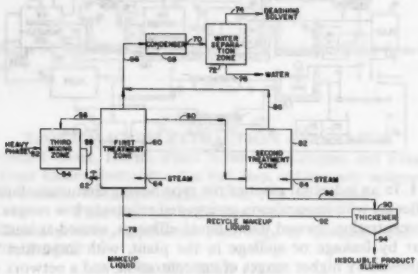
cient quantity to reduce the vapor pressure of said heavy phase and to provide a diluted heavy phase;

reducing the elevated pressure level of said diluted heavy phase;

introducing the reduced pressure diluted heavy phase into a first treatment zone maintained under conditions such that at least a portion of the deashing solvent contained in said diluted heavy phase is vaporized, said vaporization resulting in cooling of said diluted heavy phase to form a cooled slurry;

introducing makeup water into said first treatment zone to admix with the heavy phase to effect formation of the slurry present therein;

withdrawing a portion of said cooled slurry to provide said




recycle cool slurry which is contacted with said heavy phase;

withdrawing another portion of said cooled slurry and introducing said withdrawn portion into a second treatment zone, said second treatment zone maintained under conditions such that at least a portion of any deashing solvent infused in the insoluble coal products is caused to diffuse therefrom as vaporized deashing solvent;

withdrawing vaporized deashing solvent from said first and second treatment zones;

condensing said vaporized deashing solvent for recycle to provide at least a portion of said deashing solvent present in said feed mixture; and

withdrawing said remaining slurry from said second treatment zone.

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4,313,820

## HYDRODESULFURIZATION OF ORGANIC SULFUR COMPOUNDS AND HYDROGEN SULFIDE REMOVAL WITH INCOMPLETELY SULFIDED ZINC TITANATE MATERIALS

**Floyd E. Farha, Jr., and Lloyd E. Gardner, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.**

**Continuation-in-part of Ser. No. 125,438, Feb. 28, 1980, abandoned. This application Sep. 23, 1980, Ser. No. 190,004**

**Int. Cl.³ C10G** *45/04, 45/60*

**U.S. Cl. 208—213** **38 Claims**

1. A process for hydrodesulfurizing an organic sulfur compound contained in a fluid stream to convert the sulfur in the organic sulfur compound to hydrogen sulfide and for removing hydrogen sulfide from the fluid stream comprising the step of contacting said fluid stream under suitable hydrodesulfurization conditions with an incompletely sulfided catalyst/absorbing composition comprising zinc titanate, and at least one promoter selected from the group consisting of vanadium, chromium, manganese, iron, cobalt, nickel, molybdenum, rhenium, and compounds thereof, wherein the concentration by weight of said at least one promoter in said catalyst/absorbing composition is less than the total concentration by weight of said zinc titanate in said catalyst/absorbing composition.

26. A process for hydrodesulfurizing an organic sulfur compound contained in a fluid stream, which does not contain hydrocarbons which are subject to dehydrogenation, reforming or hydrocracking, to convert the sulfur in the organic sulfur compound to hydrogen sulfide and for removing hydrogen sulfide from the fluid stream comprising the step of contacting said fluid stream under suitable hydrodesulfurization conditions with an incompletely sulfided catalyst/absorbing composition comprising zinc titanate.

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4,313,821

## PROCESSING OF COAL LIQUEFACTION PRODUCTS

**William E. Garwood, Haddonfield, N.J.; Sterling E. Voltz, Media, Pa., and Ellen L. Wu, Glassboro, N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

**Continuation of Ser. No. 941,437, Sep. 11, 1978, abandoned. This application Mar. 10, 1980, Ser. No. 128,658**

**Int. Cl.³ C10G** *25/05*

**U.S. Cl. 208—245** **11 Claims**

1. A process for removing undesirable components from the light organic liquid by-products of Solvent Refined Coal liquefaction processes containing the same, said by-products boiling in the gasoline range and having a specified octane number which comprises the steps of (1) subjecting said light organic liquid by-products to an ion-exchange resin treatment allowing adsorption of at least a portion of said undesirable components by said ion-exchange resin, and (2) contacting the resultingly partially undesirable component-depleted light organic liquid with a zeolite acting as an adsorbent for the remaining undesirable components in said depleted light organic liquid, thereby further reducing the concentration of same under controlled conditions of space velocity, temperature, and pressure, while simultaneously preserving or enhancing the octane number of said light organic liquid by-products.

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4,313,822

## METHOD FOR RECOVERING THE LEAD AND ZINC VALUES IN SECONDARY SCRUBBER MUDS FROM BLAST FURNACE GASES

**Jean M. Cases; Georges Valence, both of Vandoeuvre, and Olivier Lietard, Precy sur Oise, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France**

**Continuation of Ser. No. 7,182, Jan. 29, 1979, Pat. No. 4,250,027. This application Jul. 24, 1980, Ser. No. 171,813**

**Claims priority, application France, Jan. 31, 1978, 78 02676**

**The portion of the term of this patent subsequent to Feb. 10, 1998, has been disclaimed.**

**Int. Cl.³ B07B** *1/00*

**U.S. Cl. 209—233** **6 Claims**

1. A process for recovering lead and zinc values from blast furnace scrubber mud which comprises:

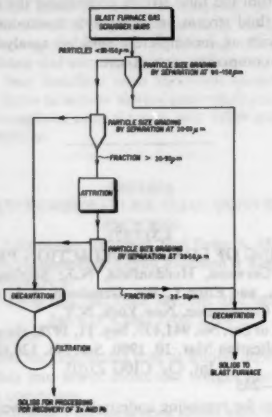
(a) separating from said mud a first fraction having particle sizes less than about 80–150 μm;

(b) separating from said first fraction a second fraction having a particle size greater than about 10 to 50 μm;

(c) scouring by attrition said second fraction having a particle size greater than about 10 to 50 μm to separate lead and zinc values from said fraction;

(d) separating the particles from steps (b) and (c) having a

size less than about 10 to 50 μm for recovery of the lead and zinc values contained therein; and




(e) recycling to the feed of the blast furnace the fractions from steps (a) and (c) having a particle size greater than about 10 to 50 μm.

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**4,313,823**

**SIEVE DEVICE FOR SEPARATING A MIXTURE OF PARTICULATE MATERIAL IN COMPONENTS OF DIFFERENT SIZES**

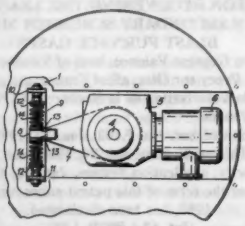
**Jan A. K. Locker, Steenwijk, Netherlands, assignor to Machinefabriek A. Wijnveen B.V., Ede and Cooperative Landbouw aan- en verkoopcombinatie, B.A. "C.L.C.", Steenwijk, both of, Netherlands**

**Filed Oct. 10, 1980, Ser. No. 196,090**

**Claims priority, application Netherlands, Oct. 12, 1979, 7907587**

**Int. Cl.³ B07B *1/08***

**U.S. Cl. 209—369** **2 Claims**



1. In a sieve device for separating a mixture of particulate material into components of different sizes, said sieve device having a perforated sieve surface rotated by a central vertical shaft in a housing, improved means for compensating for torsional shock loads applied to the sieve surface and shaft wherein said shaft is mounted on said housing and rigidly coupled to a drive means for positioning the latter adjacent the housing, and wherein a spring device extends normal to said shaft and is interposed between said drive means and housing for resiliently absorbing said torsional shock loads.

**4,313,824**

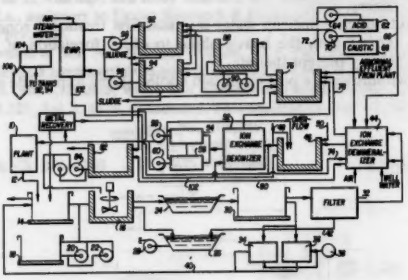
**WASTE WATER TREATMENT SYSTEM AND PROCESS**

**Christina L. Huss, and Jon K. West, both of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.**

**Filed Nov. 24, 1980, Ser. No. 200,349**

**Int. Cl.³ C02C *5/00***

**U.S. Cl. 210—86** **4 Claims**




1. In an industrial plant of the type having first waste liquid effluents with impurities in anticipated relatively low ranges of concentration; second waste liquid effluents, caused at least in part by leakage or spillage in the plant, with impurities in significantly higher ranges of concentration; and a network of drainage trenches for removing said effluents from the plant, the improvement comprising:

at least one liquid dam in said network for blocking flow of liquid through at least one of said trenches and thereby stopping the flow of said second liquid effluents from the plant;

means for detecting intermediate and low levels of said second liquid effluents behind said at least one liquid dam;

means responsive to said detecting means for pumping said second liquid effluents from behind said dam when the liquid level is between said intermediate and low liquid levels;

means connected to said pumping means for concentrating the impurities in said second liquid effluents, for disposal;

at least one conduit for receiving the flow of said first liquid effluents and directing it past said at least one liquid dam;

means connected to said at least one conduit for removing the impurities in said first liquid effluents, whereby acceptably clean water is produced; and

means for passing said acceptably clean water back to the plant for reuse.

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**4,313,825**

**CONTROL SYSTEM FOR METER ACTUATED REGENERATION IN A WATER TREATMENT SYSTEM**

**Andrew J. Fleckenstein, Brookfield, and Michael C. Morti, Glendale, both of Wis., assignors to L. W. Fleckenstein, Inc., Brookfield, Wis.**

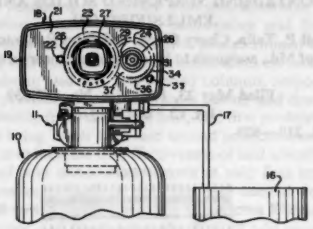
**Filed Feb. 23, 1981, Ser. No. 236,993**

**Int. Cl.³ C02F *5/00*; G05G *17/00***

**U.S. Cl. 210—89** **7 Claims**

1. A control for regeneration of a water treatment system having an inlet for receiving water to be treated and an outlet for dispensing treated water, said control system including a regeneration cycle mechanism, a timer wheel driven by a motor settable for a given time of day, a water meter disposed in constant communication with either said inlet or said outlet and continuously driven by the passage of water through said meter, and a water volume wheel mechanically driven constantly by said water meter such that said water volume wheel is rotatable to an operative position upon the passage of a predetermined volume of water through said water meter during its continued operation so as to coact with said timer

wheel at a predetermined time such that regeneration will automatically take place after the treatment of a predetermined volume of water but will begin only at a predetermined time of day.



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**4,313,826**

## LIQUID-LIQUID EXTRACTION APPARATUS

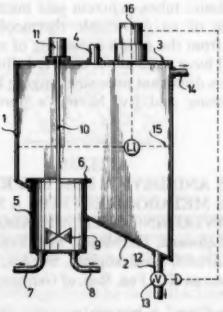
**Reinhard Gradl, Hürth; Klaus Schrödter, Cologne, and Klaus-Peter Ehlers, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Jun. 30, 1980, Ser. No. 164,035**

**Claims priority, application Fed. Rep. of Germany, Jul. 4, 1979, 2926959**

**Int. Cl.³ B01D *17/02***

**U.S. Cl. 210—114** **3 Claims**



1. A mixer/settler-type apparatus for continuous liquid-liquid extraction which comprises: a mixing vessel being provided, near its upper end, with a turned down overflow edge and a separating vessel being provided with an inclined bottom portion and a cover; said mixing vessel being tightly mounted in the inclined bottom portion of the separating vessel so as to partially open thereinto; a cover-supported motor driving a shaft terminating inside the mixing vessel and being provided with an agitator fastened thereon; said mixing vessel being formed with an inlet for admitting dense phase and an inlet for admitting light phase, at least one of said inlets being arranged so as to open into the mixing vessel through the bottom portion thereof; said separating vessel being formed with an upper outlet for light phase passed through its sidewall, near the cover and being further formed with a lower outlet for dense phase passed through the inclined bottom, near the lowermost level thereof; a cover-supported regulator connected to a level indicator LI for investigating the phase boundary surface area inside the separating vessel, said level indicator LI being disposed at a level necessary for the phase boundary surface area to lie distinctly above the overflow edge of the mixing vessel; the lower outlet of the separating vessel being provided with an automatically actuated valve; and said regulator receiving signals from the level indicator LI in the event of the phase boundary surface area varying, and giving adjustment instructions to the automatically actuated valve.

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**4,313,827**

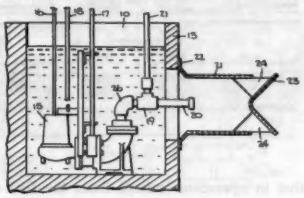
## ENHANCED DISINFECTION SYSTEM

**Brian J. Ratigan, Philadelphia, and Robert N. Roop, Buckingham, both of Pa., assignors to Fischer & Porter Co., Warminster, Pa.**

**Filed Sep. 4, 1980, Ser. No. 184,031**

**Int. Cl.³ C02F *1/50, 1/76***

**U.S. Cl. 210—136** **8 Claims**



1. An enhanced disinfectant system for intermingling a disinfectant with an effluent stream, said system comprising:

A. a mixing duct through which said effluent stream is conducted from a sump chamber into a contact chamber;

B. an ejector coupled to said disinfectant source and terminating in a cylindrical diffuser section having a closed end, said diffuser section being coaxially disposed at the inlet to said duct and having at least one circumferential series of orifices;

C. pump means drawing a minor portion of said effluent from said sump chamber and feeding it under pressure into said ejector as the motive fluid therefor to create a vacuum educting said disinfectant from the source to produce a disinfectant fluid which is emitted from the circumferential series of orifices of the diffuser section in the form of radial jets projecting at right angles to the direction of effluent flow and at a velocity substantially greater than the velocity of said effluent stream to create a disinfectant curtain that is intercepted and detected by said stream, whereby said disinfectant fluid is dispersed in said stream to intermix therewith in a relatively short time before the stream is discharged into said contact chamber; and

D. a baffle secured to the outlet of the duct and spaced therefrom to define a lateral discharge opening therebetween from which the disinfected effluent is discharged radially into said contact tank, said baffle impeding the discharge of the effluent to further promote rapid mixing of the disinfectant fluid and the effluent stream in said duct.

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**4,313,828**

## HIGH PRESSURE TUBING COUPLER

**Robert Brownlee, Santa Clara, Calif., assignor to Brownlee Labs, Inc., Santa Clara, Calif.**

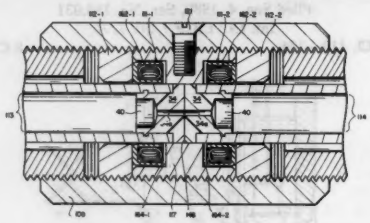
**Filed Mar. 26, 1979, Ser. No. 23,954**

**Int. Cl.³ B01D *15/08***

**U.S. Cl. 210—198.2** **10 Claims**

1. Apparatus forming a high pressure coupler for coupling and decoupling a tube to another part to provide a zero dead volume connection therebetween, a fitting connected or associated with said part for high pressure liquid delivery or reception, said fitting including means forming an opening for receiving said tube, said means including a first recess forming a chamber for receiving the end of said tube, means forming a zero dead volume seal between said fitting and said tube, said fitting further including an annular recess spaced away from said chamber in the direction of said tube and surrounding the same, a spring loaded balanced hydraulic seal disposed in said annular recess, means for keeping the balanced liquid pressure

actuated seal in said annular recess, said balanced seal being dimensioned to lie in close fitting contact between said tube and the wall defining said annular recess, means within said hydraulic seal for yieldably urging the same between the annular recess and the outer wall of said tube and providing a low pressure seal thereby, said balanced seal being U-shaped in radial cross section and open towards said first seal and chamber so that in operation leakage from the first seal fills the balanced seal to the pressure passing between the tube and coupler to cause radial forces of equal magnitude to be applied between said tube and the wall of said annular recess in said fitting thereby effecting automatic sealing to a pressure equal to the high pressure of the fluid passing therethrough and means for urging the tube and coupler together to establish said first zero dead volume seal.



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**4,313,829**

## APPARATUS FOR SEPARATING THE COMPONENTS OF A NON-NEWTONIAN FLUID

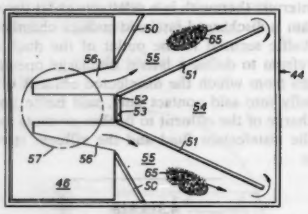
**Joram Agar, Grand Cayman, British West Indies, assignor to Agar Corporation N.V., Netherlands Antilles**

**Filed Feb. 27, 1980, Ser. No. 125,075**

**Claims priority, application United Kingdom, Feb. 1, 1980, 03552/80**

**Int. Cl.³ C02F *1/40*; E02B *15/04***

**U.S. Cl. 210—242.3** **10 Claims**



1. Apparatus for separating the components of a non-Newtonian fluid comprising a reciprocable member adapted to be in contact with the fluid; a slotted member having at least one slot therein, the slotted member being disposed adjacent to but spaced from the reciprocable member to cause reciprocation of the reciprocable member away from the slotted member to draw the fluid into the space between said reciprocable member and said slotted member and reciprocation of the reciprocable member towards the slotted member to expel the fluid from said space; means for reciprocating the reciprocable member relatively fast in one direction of reciprocation and relatively slowly in the opposite direction thereof; and means defining at least one collection space which communicates with said at least one slot, reciprocation of the reciprocable member moving one of the components of the fluid to said at least one collection space.

**4,313,830**

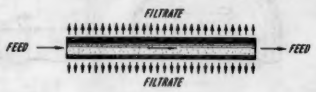
## METHOD FOR INCREASING THE CROSS-FLOW MICROFILTRATION FLUXES OF WASTE WATERS CONTAINING SUSPENDED SOLIDS AND/OR EMULSIFIED OIL

**Marshall P. Tulin, Chevy Chase, and John E. Santo, Columbia, both of Md., assignors to Hydronautics, Incorporated, Laurel, Md.**

**Filed May 23, 1980, Ser. No. 152,639**

**Int. Cl.³ B01D *13/00***

**U.S. Cl. 210—639** **10 Claims**




1. A method for increasing the cross-flow microfiltration fluxes of waste waters containing suspended solids and/or emulsified oil comprising the steps of:

(a) adding sulfuric acid to waste waters in an amount sufficient to lower the pH of said waste waters to an acidic value,

(b) adding calcium hydroxide to said acidified waste waters in an amount sufficient to form calcium sulfate in situ in the waste water in an amount ranging from above the solubility limit of said calcium sulfate to about forty (40) percent by weight of said waste waters and,

(c) filtering said waste waters containing said calcium sulfate by cross-flow microfiltration through microporous thermoplastic tubes, wherein said microporous tubes; (i) are made of an extrudable thermoplastic composition selected from the group consisting of nylon and polyethylene; (ii) have walls about one (1) millimeter in thickness; (iii) have a dominant pore size ranging from one (1) to ten (10) microns; and (iv) having a porosity of about 65 percent.

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**4,313,831**

## PROCESS AND DEVICE FOR THE REMOVAL OF WASTE METABOLITES FROM A SOLUTION CONTAINING SUCH METABOLITES

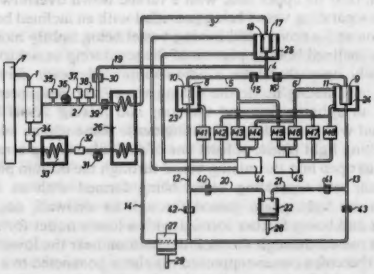
**Hans-Dieter Lehmann, Hechingen, Fed. Rep. of Germany, and Lars-Ake Larsson, Loddekopinge, Sweden, assignors to Gambro Dialysatoren KG, Fed. Rep. of Germany and Gambro AB, Sweden**

**Filed Dec. 17, 1979, Ser. No. 104,446**

**Claims priority, application Sweden, Jan. 4, 1979, 7900063**

**Int. Cl.³ B01D *13/00***

**U.S. Cl. 210—646** **12 Claims**



1. A process for the removal of waste metabolites from a metabolite-containing solution by alternately adsorbing and desorbing said metabolites on an adsorbent contained in a plurality of columns, said process coprising alternately delivering said metabolite-containing solution to said first and second adsorbent-containing columns so as to alternately adsorb and

desorb said metabolites on said adsorbent in said first and second columns, respectively, said metabolites being adsorbed on said adsorbent during said delivery of said metabolite-containing solution to said columns, and said metabolite-containing solution remaining in contact with said adsorbent during said desorption of said columns, maintaining said first and second columns, respectively, at a first predetermined temperature during said adsorption of said metabolites on said adsorbent, maintaining said first and second columns, respectively, at a second predetermined temperature during said desorption of said metabolite from said adsorbent, said first predetermined temperature being lower than said second predetermined temperature so as to increase the effectiveness of said adsorbent for adsorption of said metabolites therein at said first predetermined temperature, flushing said first and second columns, respectively, with a flushing solution subsequent to desorption of said columns, and terminating the flow of said metabolite-containing solution to said first and second columns, respectively, prior to flushing said columns so that desorption of said columns is carried out substantially without the flow of liquid therein.

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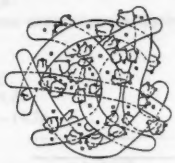
**4,313,832**

## METHOD FOR TREATMENT OF AQUEOUS SOLUTIONS WITH ION EXCHANGE FIBERS

**Hiroshi Shimizu, Tokyo; Toshiyuki Daigo, Kashiwa, and Hideo Azuma, Kasukabe, all of Japan, assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Filed Jun. 12, 1980, Ser. No. 158,971**
**Int. Cl.³ B01D *37/02, 15/04***
**U.S. Cl. 210—663** **17 Claims**



9. A process for simultaneously removing ionic impurities and suspended particulate impurities from an aqueous solution containing said impurities which comprises the consecutive steps of:

(a) mixing ion exchange fibers having a thickness from about 2 to about 200 micrometers and a length of more than twice their thickness, to intertwine the fibers into a compact mass,

(b) converting the compact mass of fibers into a slurry with water and applying the slurry to a filter support, to form a precoat layer thereon, and

(c) passing the aqueous solution containing the impurities through the precoat layer to remove the impurities.

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**4,313,833**

## WASTE WATER TREATMENT SYSTEM AND PROCESS

**Jon K. West, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.**

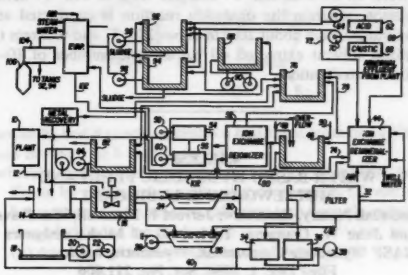
**Filed Oct. 24, 1980, Ser. No. 200,350**
**Int. Cl.³ C02C *5/00***
**U.S. Cl. 210—663** **5 Claims**

1. In an industrial plant of the type having first waste liquid effluents with impurities in anticipated relatively low ranges of concentration; second waste liquid effluents, caused at least in part by leakage or spillage in the plant, with impurities in significantly higher ranges of concentration; and a network of drainage trenches for removing said effluents from the plant, the improvement comprising:

at least one liquid dam in said network for blocking flow of liquid through at least one of said trenches and thereby stopping the flow of said second liquid effluents from the plant;

at least one conduit for receiving the flow of said first liquid effluents and directing said flow past said at least one liquid dam;

means for pumping said second liquid effluents from behind said at least one dam;



means connected to said at least one conduit for removing said impurities, whereby acceptably clean water is produced;

means for passing said acceptably clean water back to said plant for reuse; and

means connected to said pumping means for concentrating the impurities in said second liquid effluents, for disposal.

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**4,313,834**

## HIGH VISCOSITY ACIDIC TREATING FLUIDS AND METHODS OF FORMING AND USING THE SAME

**Lawrence E. Harris, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.**

**Division of Ser. No. 947,327, Oct. 2, 1978. This application Oct. 29, 1979, Ser. No. 89,080**
**Int. Cl.³ E21B *43/27***
**U.S. Cl. 252—8.55 C** **14 Claims**

1. A method of forming a high viscosity acidic treating fluid which is stable at high temperatures comprising:

combining a hydratable gelling agent having a molecular weight greater than 100,000 and selected from the group consisting of carboxymethylhydroxyethyl cellulose having a DS in the range of about 0.1 to 1.0 and a MS in the range of about 0.5 to 5.0, carboxymethylhydroxypropyl guar having a DS in the range of about 0.05 to 0.5 and a MS in the range of about 0.01 to 1.0, carboxyethylhydroxypropyl guar having a DS in the range of from about 0.01 to 0.5 and a MS in the range of from about 0.01 to 1.0 and mixtures thereof with an aqueous fluid to form an aqueous gel;

combining an at least partially water or acid soluble zirconium salt with said aqueous gel; and

combining at least one acid selected from the group consisting of hydrochloric acid, acetic acid, formic acid and mixtures thereof with said aqueous gel-zirconium salt mixture to lower the pH of said mixture to below about 3 thereby causing said aqueous gel to be rapidly cross-linked by said zirconium salt.

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**4,313,835**

## EMULSIFIER SYSTEM FOR TERTIARY OIL RECOVERY

**Harvey E. Alford, Amherst, and David Frazier, Lakewood, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio**

**Filed Nov. 21, 1979, Ser. No. 97,029**
**Int. Cl.³ E21B *43/22***
**U.S. Cl. 252—8.55 D** **6 Claims**

1. In a process for the tertiary recovery of oil wherein brine

or water, an emulsifier system and a polymer are injected into an injection well and oil recovered from a producing well, the improvement comprising using as said emulsifier system a mixture of 0.5 to 12 parts by weight of a surfactant and 1 part by weight of an alcohol having no more than 12 carbon atoms, said surfactant comprising a neutralized air-oxidized solvent extracted oil wherein the solvent extracted oil has a viscosity between 50 SUS at 100° F. and 250 SUS at 210° F. before oxidation, wherein the oxidation reaction is conducted at a temperature from about 200° to about 250° F. and wherein the oxidized solvent extracted oil has an acid number of 10–40 before neutralization.

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**4,313,836**

## WATER-BASED HYDRAULIC FLUID AND METALWORKING LUBRICANT

**Assadullah Nassry, Riverview; Jerrold F. Maxwell, Woodhaven, and John W. Compton, Taylor, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.**

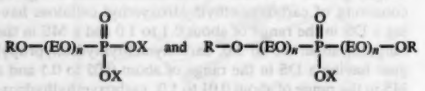
**Filed Dec. 1, 1980, Ser. No. 211,606**
**Int. Cl.³ C10M *3/42***
**U.S. Cl. 252—32.7 E** **12 Claims**

1. A hydraulic fluid or metalworking fluid concentrate consisting essentially of:

A. a sulfurized metallic compound of the formula:

wherein M is molybdenum or antimony and wherein R is selected from the group consisting of alkyl, aryl, alkylaryl radicals and mixtures thereof having 3 to 20 carbon atoms in the alkyl group,

B. a phosphate ester selected from the group consisting of




and mixtures thereof, wherein EO represents ethylene oxide groups; R is selected from the group consisting of linear or branched chain alkyl groups having about 6 to 30 carbon atoms or alkylaryl groups wherein the alkyl groups have 6 to 30 carbon atoms; X is selected from the group consisting of hydrogen, alkali or alkaline earth metal, the residual of ammonia or an amine and mixtures thereof and n is a number from 1 to 50 and optionally

C. a supplemental additive selected from the group consisting of corrosion inhibitor, thickener, and metal deactivator and mixtures thereof

wherein the ratio of said phosphate ester to said sulfurized metallic compound is from about 0.1:1 to 2.5:1 by weight based upon the weight of the sulphur in said metallic compound.

4. A hydraulic fluid or metalworking lubricant fluid consisting essentially of the composition of claim 1 and from about 40 to 99 percent by weight water at a pH above 7.

12. In a process for transmitting force hydraulically by applying a force to a confined fluid and said fluid transmits said force to an actuating means which is actuated by the force of said confined fluid, the improvement wherein said confined fluid is the hydraulic fluid of claim 4.

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**4,313,837**

## USING MOLYBDATES TO INHIBIT CORROSION IN WATER-BASED METALWORKING FLUIDS

**Mark S. Vukasovich, Ann Arbor, and Dennis R. Robitaille, Canton, both of Mich., assignors to AMAX, Inc., Greenwich, Conn.**

**Filed May 2, 1980, Ser. No. 145,951**
**Int. Cl.³ C10M *1/06***
**U.S. Cl. 252—49.5** **3 Claims**

1. A metalworking fluid comprising an aqueous solution or an oil-water emulsion, which inhibits corrosion of metal surfaces which the fluid contacts during a metalworking operation, the fluid having a pH value between about 8 and about 10 and containing dissolved in water a corrosion inhibitor consisting essentially of about 0.5% by weight monoethanolamine borate and about 0.3% by weight $MoO_4^{-2}$ anion.

2. A metalworking fluid comprising an aqueous solution or an oil-water emulsion, which inhibits corrosion of metal surfaces which the fluid contacts during a metalworking operation, the fluid having a pH value between about 8 and about 10 and containing dissolved in water a corrosion inhibitor consisting essentially of about 1% by weight triethanolamine oleate and about 0.6% by weight $MoO_4^{-2}$ anion.

3. A metalworking fluid comprising an aqueous solution or oil-water emulsion, which inhibits corrosion of metal surfaces which the fluid contacts during a metalworking operation, the fluid having a pH value between about 8 and about 10 and containing dissolved in water a corrosion inhibitor consisting essentially of about 0.5% triethanolamine phosphate and about 0.3% by weight $MoO_4^{-2}$ anion.

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**4,313,838**

## PREPARATION AND USE OF XANTHOGEN CHLOROPROPYL FORMATE FLOTATION REAGENTS

**Arthur H. Fischer, 1115 Fifth Ave., New York, N.Y. 10028; Lawrence E. Strow, 6507 Lawyers Hill Rd., Baltimore, Md. 21227, and Franklin A. Bolth, 516 Dunkirk Rd., Baltimore, Md. 21212**

**Division of Ser. No. 872,562, Jan. 26, 1978. This application Apr. 19, 1979, Ser. No. 31,317**
**Int. Cl.³ C07C *154/02, 69/003***
**U.S. Cl. 252—60** **5 Claims**

1. A process for preparing a xanthogen-formate bearing flotation agent, which comprises:

reacting 2-chloro isopropyl chloroformate with an alkali-metal alkyl xanthate having 2 to 6 carbons in the alkyl group in a solvent mixture of water and alcohol which is sufficient to dissolve said chloroformate and xanthate,

wherein said alcohol has the same number of carbons as said alkyl group, and

wherein said chloroformate is the reaction product of phosgene and isopropyl epoxide carried out in the presence of activated carbon as catalyst and preformed chloroformate as diluent and heat absorber.

## 4,313,839
## PIEZOCERAMIC MATERIAL

Evgeny G. Fesenko, Dolomanovsky pereulok, 2, kv. 2; Alla Y. Dantsiger, ulitsa V. Nolnaya, 14/90, kv. 91; Viktor S. Filipiev, ulitsa Engelsa, 34, kv. 35; Olga N. Razumovskaya, ulitsa Lenina, 70, kv. 25; Alexandr N. Klevtsov, prospekt Stachki, 223/3, kv. 20; Vladimir N. Lebedev, 1 Pereulok, 41; Ljudmila D. Grineva, ulitsa Gerasimenco 12, kv. 8; Tatyana V. Rogach, ulitsa Arefieva, 43; Anatoly D. Feronov, ulitsa Mechnicova, 36, kv. 9; Galina M. Akbaeva, ulitsa Kazakhskaya, 88, kv. 34; Evgeny I. Cheptsov, ulitsa Zhuravleva, 111, kv. 1; Anatoly E. Panich, ulitsa Suvorova, 40, kv. 21; Ljudmila G. Lisitsina, Budenovsky pereulok, 4, kv. 53; Svetlana A. Lavrikova, 2 Krasnodarskaya ulitsa, 163/12, kv. 1, all of Rostov-na-Donu; Vasily A. Ochirov, Mikroraion 1, 28, kv. 24, Elista, Kalmytskaya ASSR; Svetlana I. Dudkina, ulitsa Sedova, 105, kv. 4, Rostov-na-Donu; Alexandr N. Nevsky, ulitsa Sokolova, 6, kv. 11, Rostov-na-Donu; Vladimir A. Aleshin, ulitsa Gerasimenko, 13a, kv. 20, Rostov-na-Donu; Mikhail F. Kupriyanov, ulitsa Stachki, 217/3, kv. 62, Rostov-na-Donu; Evgeny S. Baljunis, 2 Krasnodarskaya ulitsa, 163/3, kv. 20, Rostov-na-Donu; Boris P. Mordanov, ulitsa Stanislavskogo, 170, kv. 7, Rostov-na-Donu; Grigory A. Zhitomirsky, Khalturinsky pereulok, 56, kv. 6, Rostov-na-Donu; Naum B. Feldman, ulitsa 11 Parkovaya, 44, korpus 4, kv. 25, Moscow; Ekaterina G. Smazhevskaya, ulitsa Parkovaya, 42, korpus 2, kv. 56, Moscow, and Ravilya U. Devlikanova, ulitsa Metallurgicheskaya, 91, Rostov-na-Donu, all of U.S.S.R.

Continuation of Ser. No. 653,886, Jan. 30, 1976, abandoned, which is a continuation of Ser. No. 341,953, Mar. 16, 1973, abandoned. This application Feb. 1, 1977, Ser. No. 764,643

Int. Cl.³ C04B *35/49*

U.S. Cl. 252—62.9 5 Claims

1. A piezoceramic material consisting essentially of, in molar percent:

$PbTiO_3$—40

$PbZrO_3$—35.40

$PbW_{\frac{1}{4}}Ni_{\frac{1}{4}}O_3$—9.84

$PbNb_{\frac{1}{4}}Mg_{\frac{1}{4}}O_3$—14.76.

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## 4,313,840
## HEAT TRANSFER OIL AND METHOD FOR DRIVING A FREON TURBINE

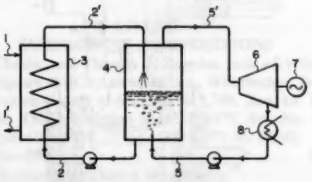
Shigeki Komatsuzaki, Mito, and Moriichi Sato, Hitachi, both of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 7, 1980, Ser. No. 128,168

Claims priority, application Japan, Mar. 7, 1979, 54-25500

Int. Cl.³ C09K *5/04;* C10M *3/20, 3/38*

U.S. Cl. 252—78.5 6 Claims



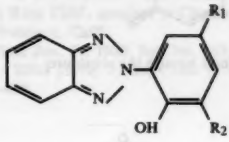

1. A heat transfer method for driving a Freon turbine comprising the steps of:

(a) transferring heat of a heat source through a heat exchanger of the indirect contact type to an intermediate heat transfer oil, consisting essentially of:

(1) a major amount of a polyolester of a reaction product of a polyhydric alcohol selected from the group consisting of neopentylglycol, trimethylolethane, trimethylolpropane and pentaerythritol with a saturated monocarboxylic acid having 7–16 carbon atoms per molecule;

(2) at least one member selected from the groups consisting of tris-(alkylphenyl)phosphite and tris-(phenyl)-phosphite, and

(3) at least one member selected from the group consisting of benzotriazole and benzotriazole derivatives having the formula




wherein $R_1$ and $R_2$ each represent a hydrogen atom or an alkyl group having 1 to 8 carbon atoms;

whereby said heated intermediate transfer oil gasifies said Freon by contact therewith, said components (2) and (3) being present in an amount sufficient to reduce the generation of chlorine ion; and

(b) driving said turbine with said gasified Freon.

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## 4,313,841
## PROCESS OF CLEANING UNWANTED FILMS

Alan B. Speigel, 1700 Harmon St., Apt. 102, Norfolk, Va. 23518, and Robert P. Zurich, 18 Wister Pl., Matawan, N.J. 07747

Continuation-in-part of Ser. No. 877,567, Feb. 13, 1978, abandoned, which is a continuation of Ser. No. 687,159, May 17, 1976, abandoned, which is a continuation of Ser. No. 375,675, Jul. 2, 1973, abandoned. This application Aug. 17, 1979, Ser. No. 67,191

Int. Cl.³ C23G *5/02;* C11D *7/50;* C09D *9/04*

U.S. Cl. 252—170 5 Claims

1. A method for cleaning an unwanted phthalates containing film from the interior surface of a glass automotive windshield which comprises applying a cleaning composition containing a mixture of a phthalates solvent and nonsolvent wherein said solvent is a mixture of isoproponol and a compound selected from the group consisting of acetone, ethylacetate, and methylethylketone; said nonsolvent is water and said water is present in said mixture in an amount of less than 50%; to the phthalates containing film, allowing sufficient time for said cleaning composition to dissolve said film and for said solvent to preferentially evaporate to cause precipitation in said water of said phthalates in a form which does not redeposit on the glass surface and then wiping away any remaining composition from said surface.

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## 4,313,842
## PROCESS FOR HYDROGENATION OF 2,6,6-TRIMETHYL CYCLOHEXENE DERIVATVES, PRODUCTS PRODUCED THEREBY AND ORGANOLEPTIC USES OF SAID PRODUCTS

Robert W. Trenkle, Bricktown; Braja D. Mookherjee; Frederick L. Schmitt, both of Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

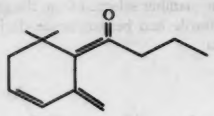
Division of Ser. No. 969,852, Dec. 15, 1978. This application Feb. 27, 1981, Ser. No. 239,049

Int. Cl.³ C11D *3/50, 9/44*

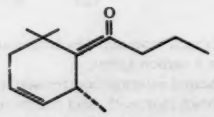
U.S. Cl. 252—174.11 2 Claims

1. A process for augmenting or enhancing the aroma of a solid or liquid anionic, cationic or nonionic detergent comprising the steps of intimately admixing with an anionic cationic or nonionic detergent base an aroma augmenting or enhancing quantity of at least one material selected from the group consisting of:

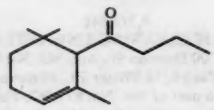
(i) the compound having the structure:

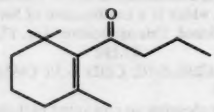


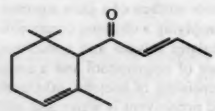
(ii) the compound having the structure:

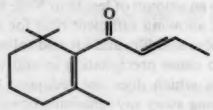


(iii) a mixture of compounds having the structures:

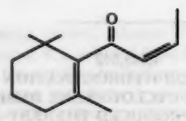






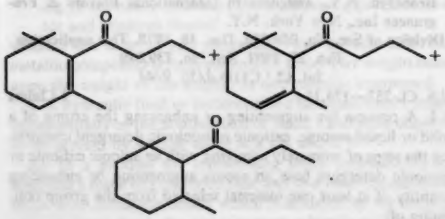


and



and

(iv) a mixture of compounds having the structures:



4,313,843

## SUPERIOR OXALATE ESTER CHEMICAL LIGHTING SYSTEM

Laszlo J. Bollyky, Stamford, and Michael M. Rauhut, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 464,285, Apr. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 205,747, Dec. 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 813,973, Apr. 7, 1969, abandoned. This application Sep. 9, 1976, Ser. No. 721,920

Int. Cl.³ C09K *11/06, 11/08*

U.S. Cl. 252—188.3 CL 6 Claims

1. A composition, useful as a component for a chemical light device, said composition comprising at least 0.01 M hydrogen peroxide in a tertiary alcohol solvent and a catalyst in the concentration range from $10^{-4}$ to $10^{-2}$ M selected from the group consisting of sodium salicylate and tetrabutylammonium salicylate.

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4,313,844

## INORGANIC ION EXCHANGER

Hiroshi Sato, Hiroshima; Sadaaki Shigeta, and Hiroyuki Uchida, both of Ootake, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Oct. 9, 1979, Ser. No. 82,658

Int. Cl.³ C09K *3/00;* C02F *1/42;* B01J *39/10, 41/10*

U.S. Cl. 252—193 8 Claims

1. An inorganic ion exchanger prepared by the process consisting of: mixing and kneading at least one titanic acid, selected from the group consisting of anatase type titanic acid and amorphous titanic acid, with water and at least one inorganic acid, selected from the group consisting of sulfuric acid, hydrochloric acid and phosphoric acid, extrusion molding the mixture, and, thereafter, heat treating the extruded product at a temperature of 50° to 500° C. for 3 to 19 hours.

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4,313,845

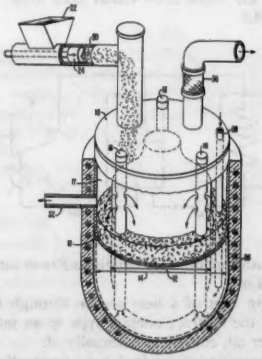
## SYSTEM FOR CHEMICALLY DIGESTING LOW LEVEL RADIOACTIVE, SOLID WASTE MATERIAL

Richard G. Cowan, Kennewick, and Albert G. Blasewitz, Richland, both of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 28, 1979, Ser. No. 98,109

Int. Cl.³ G21F *9/28, 7/06*

U.S. Cl. 252—630 8 Claims



1. An improved system for chemically digesting low level, radioactive, solid waste material comprising:

an annular vessel constructed to be substantially filled with concentrated sulfuric acid;

means for delivering the solid undigested waste into the annular vessel;

means for adding concentrated nitric acid or nitrogen dioxide to the sulfuric acid within the annular vessel while the sulfuric acid is reacting with the solid waste;

means for mixing the solid waste within the sulfuric acid so that the solid waste remains substantially fully immersed and fully dispersed;

means for removing off gas from the annular vessel; and

means for removing product slurry residue.

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## 4,313,846
## N-ACYL-O-PHENYLENEDIAMINES

**Hans R. Meyer, Binningen, and Max Siegrist, Lausen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Nov. 8, 1979, Ser. No. 92,592**

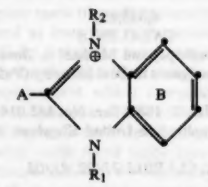
**Claims priority, application Switzerland, Nov. 20, 1978, 11883/78**

**Int. Cl.³ C09K *11/06***

**U.S. Cl. 252—301.32** **5 Claims**

1. A stable, concentrated aqueous solution of a benzimidazolium fluorescent whitening agent, which contains

(a) 5 to 40% by weight of at least one water-soluble benzimidazolium fluorescent whitening agent of the formula



wherein A a colourless, carbocyclic or heterocyclic aromatic radical, each of $R_1$ and $R_2$ independently is an alkyl, alkenyl or phenyl radical which is unsubstituted or substituted by non-chromophoric groups, but only one of $R_1$ and $R_2$ can be phenyl, and $X_1\ominus$ is the formate, acetate, propionate, glycolate, lactate, acrylate, methanephosphonate or dimethyl or diethyl phosphite anion, or mixtures thereof, and the ring B can also be substituted by non-chromophoric groups,

(b) 0 to 40% by weight of the acid corresponding to the anion $X\ominus$ and

(c) water to bulk the formulation to 100%.

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## 4,313,847
## SURFACTANT COMPOSITIONS

**David G. Chasin, and Thomas J. Zaucha, both of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.**

**Continuation-in-part of Ser. No. 915,700, Jun. 15, 1978, abandoned. This application May 25, 1979, Ser. No. 42,626**

**Int. Cl.³ B01F *17/14, 17/16, 17/34, 17/42***

**U.S. Cl. 252—356** **4 Claims**

1. A surfactant composition comprising

(a) a polyoxyethylene nonyl phenol phosphate ester,

(b) a polyoxyethylene N,N-bis(2-hydroxyethyl) alkyl amine, wherein the alkyl contains from 12 to 18 carbon atoms, and

(c) a polyoxyethylene castor oil,

wherein the amount of the polyoxyethylene nonyl phenol phosphate ester component is equal to from about 60% to about 80% by weight based upon the total weight of the composition, the amount of the polyoxyethylene N,N-bis(2-hydroxyethyl)alkyl amine is equal to from about 14% to about 30% by weight based upon the total weight of the composition and the amount of the polyoxyethylene castor oil is equal to from about 5% to about 15% by weight based upon the total weight of the composition.

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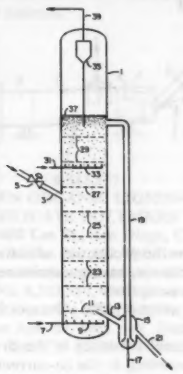
## 4,313,848
## METHOD FOR REMOVING COKE FROM PARTICULATE CATALYST

**John W. Scott, Ross, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Jun. 27, 1980, Ser. No. 163,538**

**Int. Cl.³ B01J *29/38, 21/20*; C10G *11/05, 11/04***

**U.S. Cl. 252—418** **7 Claims**



1. A method for removing nitrogen-containing coke from coke-containing particulate catalyst, which comprises:

(a) introducing said coke-containing catalyst into an intermediate vertical level of a vertically extending regeneration zone, passing said catalyst downwardly through said zone, and restricting backmixing of catalyst in said zone;

(b) introducing a regeneration gas comprising free oxygen into a lower end of said zone, passing said regeneration gas upwardly through said catalyst, burning substantially all said coke off said catalyst and substantially all carbon monoxide formed in a lower section of said regeneration zone, sufficient free oxygen being included in said regeneration gas to provide at least 1 volume percent free oxygen in contact with catalyst in said lower section, whereby nitrogen oxides are generated in said regeneration gas in said lower section;

(c) forming carbon monoxide and carbon dioxide and generating a substantially oxygen-free atmosphere in contact with said catalyst in an intermediate section of said regeneration zone by substantially completely reacting free oxygen in said regeneration gas with coke and carbon monoxide in said intermediate section, and decreasing the amount of nitrogen oxides in said regeneration gas in said intermediate section by reacting at least a portion of said nitrogen oxides in said oxygen-free atmosphere to form free nitrogen;

(d) introducing substantially coke-free catalyst into an upper section of said zone, and passing said coke-free catalyst downwardly through said zone;

(e) burning substantially all carbon monoxide contained in said regeneration gas with additional free oxygen in contact with said substantially coke-free catalyst in said upper section, and withdrawing said regeneration gas from said upper section.

2. A method according to claim 1 wherein coke in said coke-containing catalyst includes a sulfur component, sulfur oxides are formed by burning said coke, and said sulfur oxides are reacted with a solid reactant included with said catalyst particles to form sulfur-containing solids in said zone.

3. A method according to claim 2 wherein said solid reactant comprises alumina.

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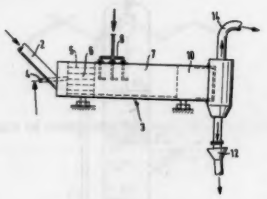
4,313,849

## PROCESS FOR THE PRODUCTION OF ACTIVATED CARBON FROM A MOIST ORGANIC SUBSTANCE

Frans H. Tuovinen, Ulvila; Risto J. Honkala, and Maija-Leena Metsärinta, both of Vanha-Ulvila, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Nov. 27, 1979, Ser. No. 97,641
Claims priority, application Finland, Nov. 28, 1978, 783641
Int. Cl.³ C01B *31/10*; C10B *49/02*
U.S. Cl. 252—421 3 Claims



1. A process for the production of activated carbon from a moist organic substance, having a moisture content of 30–70% by weight which comprises

conducting the moist organic substance into a drying zone of a as chamber;

mixing the organic substance in the drying zone with hot flue gases according to the co-current principle;

directing the dried organic substances into a coking zone of the same gas chamber;

introducing an oxygen-bearing gas into the coking zone, for the controlled burning of the volatile constituents of the organic substance at an elevated temperature and according to the co-current principle;

directing the material and hot moist gases emerging from the coking zone into an activation zone of the same gas chamber;

activating the coked material in the activation zone by mixing with the hot, moist gases according to the co-current principle and without separate addition of water vapor; and

separating the activated carbon from gases.

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4,313,850

## CATALYST FOR THE POLYMERIZATION OF ALPHA-OLEFINS

Nicholas K. Kildahl, Shrewsbury, Mass., and Peter Fotis, Highland, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 15, 1979, Ser. No. 84,981
Int. Cl.³ C08F *4/64, 4/68*
U.S. Cl. 252—429 B 50 Claims

1. A catalyst component comprising the reaction product of components comprising:

(1) at least one divalent Group IIA, IIB, IVA, VIB, VIIB or VIII metal bis(halocarboxylate) prepared by reaction of at least one divalent metal or divalent metal oxide, hydroxide or carbonate with at least one halocarboxylic acid and drying the resulting divalent metal bis(halocarboxylate),

(2) at least one oxygenated organic compound of a Group IVB or VB metal corresponding to the formula $M^1(OR^1)_m$ or $O{=}M^1(OR^1)_{m-2}$ wherein $M^1$ is a Group IVB or VB metal, each $R^1$ is independently an organic radical and m corresponds to the valence of $M^1$,

(3) at least one organoaluminum component of the formula $AlR^2_nX_{3-n}$ wherein each $R^2$ is independently a hydrocarbyl radical, X is halogen, and $O<n\leqq 3$

said components being reacted in amounts such that the atomic ratio of metal in (2) to metal in (1) ranges from about 0.05:1 to about 20:1 and the atomic ratio of aluminum in (3) to metal in (2) ranges from about 5:1 to about 50:1, with the proviso that when (3), contains less than an amount of halogen which is effective to halide the metal in (1) and (2), said components comprise, in addition to (1), (2) and (3), a component (4) which is at least one halogenating agent other than a Group IVB-VIB metal halide in an amount such that (3) and (4) contain at least an effective amount of halogen; said reaction being conducted at about 0° to about 200° C. in the substantial absence of extraneous catalyst poisons and comprising contacting components (2) and (3) in the presence of component (1).

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4,313,851

## LIQUID, COLD-STABLE TITANIUM CATALYST PREPARATION

Dieter Barfurth, Lohmar, and Heinz Nestler, Troisdorf-Eschmar, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Filed Mar. 2, 1981, Ser. No. 239,915
Int. Cl.³ B01J *31/12*
U.S. Cl. 252—431 R 5 Claims

1. A cold-stable catalytically active solution of diisopropoxy-bis (2,4-pentanedionato)-titanium (IV) in isopropanol, said solution containing 0.05 to 0.15 mol of water per mol of said titanium compound.

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4,313,852

## CATALYSTS

Derek G. Gavin, Longhope, and Michael A. Jones, Quedgeley, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Jul. 1, 1980, Ser. No. 165,014
Claims priority, application United Kingdom, Aug. 10, 1979, 27995/79
Int. Cl.³ B01J *27/02, 21/02*
U.S. Cl. 252—439 13 Claims

1. A hydrotreatment catalyst comprising molybdenum or tungsten disulphide in an amount of 0.1 to 10% by weight, on an active carbon support having a surface area in excess of 800 $m^2/g$ and in which the molybdenum or tungsten disulphide is substantially completely on the outer surface of the particles of active carbon, said catalyst prepared by absorbing molybdenum or tungsten trisulphide onto an active carbon support having a surface area in excess of 800 $m^2/g$ and having its internal pores filled with a fluid, and reducing the trisulphide to the disulphide.

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4,313,853

## PROCESS FOR FORMING HIGHLY DISPERSED METAL ON GRAPHITE

Rexford D. Sherwood, Suffern, N.Y.; Rees T. K. Baker, Murray Hill, N.J.; Eric G. Derouane, Namur, Belgium, and Wim J. M. Pieters, Morristown, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 11, 1980, Ser. No. 215,514
Int. Cl.³ B01J *21/18*
U.S. Cl. 252—445 14 Claims

1. A process for dispersing metal agglomerated on graphite wherein said metal is selected from the group consisting essentially of Ni, Co, Mo and mixtures thereof said process comprising the sequential steps of:

(a) contacting said metal-agglomerated/graphite composite with net-reducing, hydrogen-containing atmosphere at a temperature ranging between about 800°–975° C. for a time sufficient for the metal to form a plurality of metal-containing channels in the graphite;

(b) contacting said channeled composite formed in (a) with a net-reducing, hydrogen-containing atmosphere at a temperature of at least about 975° C. for a time sufficient for said metal in said channels to spread out and chemically wet at least a portion of the surface of said channels; and

(c) contacting said metal-wetted, channeled composite formed in (b) with an oxidizing atmosphere at a temperature of at least about 800° C. to form a dispersion of discrete particles of said metal on the surface of said so-formed channels on said graphite.

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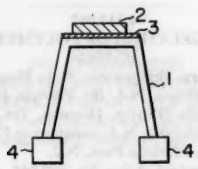
4,313,854

## OXIDE-COATED CATHODE FOR ELECTRON TUBE

Kazuo Sunahara, and Akira Misumi, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1979, Ser. No. 91,840
Claims priority, application Japan, Nov. 15, 1978, 53-139903
Int. Cl.[3] A01B *1/04*
U.S. Cl. 252—516 8 Claims




1. In an oxide-coated cathode for electron tubes comprising a base metal plate made of an alloy containing nickel as a major component and at least one high-melting point metal in an amount of 2% by weight or more, and an electron emissive alkaline earth metal oxide layer adhered to the base metal plate, the improvement which comprises having a carbide layer made of at least one carbide of Si, B, Ti, Zr, Hf, V, Nb, Ta, Mo or W between the base metal plate and the electron emissive alkaline earth metal oxide layer, said carbide layer having a thickness sufficient for repressing an interfacial reaction between the base metal plate and the alkaline earth oxide layer and being not more than 5000 Å.

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4,313,855

## FIXATIVE FOR PERFUME COMPOSITIONS

Erich Klein, and Willi Rojahn, both of Holzminden, Fed. Rep. of Germany, assignors to Dragoco Gerberding & Co. GmbH, Holzminden, Fed. Rep. of Germany

Division of Ser. No. 11,889, Feb. 13, 1979, Pat. No. 4,252,986, and a continuation-in-part of Ser. No. 11,889,. This application Mar. 18, 1980, Ser. No. 131,545
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1978, 2807584
Int. Cl.[3] C11B *9/00*
U.S. Cl. 252—522 R 8 Claims

1. The method of use of the compound 1-(2,6,6-trimethylcyclohexyl)-hexane-3-ol comprising adding said compound to a composition as a fixative.

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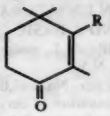
4,313,856

## PERFUME COMPOSITIONS CONTAINING OXYGENATED IONONE DERIVATIVES

Roman Kaiser, Uster, and Dietmar Lamparsky, Wangen-Dübendorf, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Continuation of Ser. No. 68,921, Aug. 23, 1979, abandoned, which is a division of Ser. No. 889,070, Mar. 22, 1978. This application Oct. 6, 1980, Ser. No. 194,651
Claims priority, application Austria, Mar. 28, 1977, 2158/77
Int. Cl.[3] C11B *9/00*
U.S. Cl. 252—522 R 9 Claims

1. A perfume composition comprising an effective amount of a compound having the formula

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wherein R represents a butyl, but-2-en-1-yl or 1,3-butadienyl, and at least one other olfactory substance excepting those compositions wherein compound I is present as part of a mixture which was derived from, or is identical to a mixture derived from, natural sources.

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4,313,857

## BROKEN-DOWN ORGANIC LIGNIN-CELLULOSE SILICATE POLYMERS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 203,730, Nov. 3, 1980, Pat. No. 4,281,110, which is a continuation-in-part of Ser. No. 112,290, Jan. 15, 1980, Pat. No. 4,243,757, which is a continuation-in-part of Ser. No. 29,202, Apr. 12, 1979, Pat. No. 4,220,757. This application Apr. 24, 1981, Ser. No. 257,126
Int. Cl.[3] C08B *31/00*
U.S. Cl. 260—13 9 Claims

1. The process for the production of broken-down organic lignin-cellulose silicate polymer by mixing and reacting the following components:

Component (a): Broken-down alkali metal lignin-cellulose silicate polymer;

Component (b): A substituted organic compound having a substituent which will split off during the reaction, to said broken-down alkali metal lignin-cellulose polymer in the amount wherein the mols of the substituted radicals are about equal to the mols of the alkali radicals in the mixture.

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4,313,858

## POLYURETHANE ENCAPSULATING RESINS

Mason H. Earing, Williamsville, N.Y.; Paul F. Martin, Fairfield, Ohio, and Glenn H. Petschke, Tonawanda, N.Y., assignors to Textron, Inc., Providence, R.I.

Filed Jun. 9, 1980, Ser. No. 157,868
Int. Cl.[3] C08G *18/04, 18/69*
U.S. Cl. 260—18 TN 20 Claims

1. A polyurethane resin system which comprises an isocyanate-terminated polyurethane prepolymer of polyisocyanate and first polyol component, and a second polyol component for reacting with said prepolymer to form a polyurethane resin polymer having pendant vinyl groups provided by the presence of a hydroxy-terminated diene polymer polyol in one or both of said first and second polyol components, said system further comprising drying oil having an iodine number of up to about 200 in a minor amount sufficient to reduce substantially the viscosity of said diene polymer polyol; and a peroxide catalyst in an amount sufficient to promote reaction of said pendant vinyl groups to provide a relatively thermally-stable, polyurethane resin product when cured.

4,313,859

## COMPOSITION CONTAINING A HALF ESTER OF AN ORGANIC POLYOL, AN UNSATURATED MONOMER, AN EPOXIDE, AND A BASIC COMPOUND

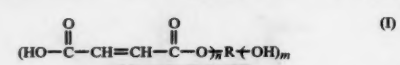
Hugh C. Gardner, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 147,098, May 7, 1980, abandoned, which is a continuation of Ser. No. 70,007, Aug. 27, 1979, abandoned. This application Jul. 28, 1980, Ser. No. 171,081

Int. Cl.³ C08G 59/42, 63/42

U.S. Cl. 260—18 PF 18 Claims

1. A curable polymerizable liquid mixture comprising (a) a half ester characterized by the following



(I)

wherein n is a number having an average value of about 1.5 to less than about 4, m is equal to the free valence of R less the average value of n, R is the hydroxyl-free residue of an organic polyol which contained from 2 to 4 inclusive, hydroxyl groups, OH, in formula (I), (b) maleic anhydride, (c) an epoxide containing two or more 1,2-epoxide radicals, (d) an ethylenically unsaturated monomer which forms a liquid homogeneous mixture with the half ester, maleic anhydride and the epoxide, and (e) a basic compound.

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4,313,860

## NON-PHOTOCHEMICALLY REACTIVE ANTIFOULING PAINT

Jesse R. Neal, Jr., Concord, and Henry R. Bleile, Vallejo, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1980, Ser. No. 144,082

Int. Cl.³ C08L 93/04; C09D 5/16

U.S. Cl. 260—27 R 2 Claims

1. A marine vinyl-type antifouling coating comprising:

(a) a vinyl chloride-vinyl acetate copolymer component containing approximately 85 to 88 percent vinyl chloride, approximately 12 to 15 percent vinyl acetate and constituting about 55 parts by weight of said coating:

(b) rosin constituting about 215 parts by weight of said coating;

(c) a cuprous oxide pigment component constituting about 1440 parts by weight of said coating;

(d) a tricresyl phosphate component constituting about 50 parts by weight of said coating;

(e) an antisettling component constituting about 7 parts by weight of said coating; and

(f) a solvent component constituting less than fifteen percent by weight of said coating and having subcomponents constituting about 14 parts by weight 2-ethoxyethanol, about 56 parts by weight n-butyl alcohol and about 210 parts by weight n-butyl acetate of said coating.

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4,313,861

## LATEX AUTODEPOSITION COATINGS

David R. Bassett, Charleston, and Alan E. Wang, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 28, 1980, Ser. No. 125,692

Int. Cl.³ C08L 33/02

U.S. Cl. 260—29.6 H 16 Claims

1. In an aqueous autodeposition coating composition have a pH of less than 7 comprising:

(I) water;

(II) a source of hydrogen ion; and

(III) from 6 weight percent to 50 weight percent of a latex, the improvement wherein said latex is an acrylic polymer latex comprising the polymer of:

(A) from 1 weight percent to 20 weight percent of methacrylic acid or from 1 weight percent to 12 weight percent of acrylic acid;

(B) from 75 weight percent to 99 weight percent of at least one other polymerizable ethylenically monounsaturated monomer;

(C) from 0 weight percent to 20 weight percent of a different hydroxy group containing polymerizable vinylenically monounsaturated monomer; and

(D) from 0 weight percent to 1.5 weight percent of a polymerizable vinylenically polyunsaturated monomer;

wherein the concentrations of components A-D are based on the total combined weight of components A-D, and wherein said acrylic polymer latex has a particle size of less than 0.3 micron and a glass transition temperature of from 2° C. to 50° C.

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4,313,862

## PROCESS FOR GELATION OF POLYMERIC SOLUTION (C-1042)

Robert D. Lundberg, Bridgewater, N.J.; Henry S. Makowski, late of Scotch Plains, N.J. (by Patricia Helen Makowski, executrix); Dennis O'Brien, Houston, Tex., and Robert R. Klein, Berkeley Heights, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 930,044, Aug. 1, 1978, abandoned, and Ser. No. 106,027, Dec. 21, 1979, Pat. No. 4,282,130. This application Apr. 3, 1980, Ser. No. 136,835

Int. Cl.³ C08F 8/36

U.S. Cl. 260—29.6 SQ 25 Claims

1. A process for forming a polymeric solution or water insoluble gel having a viscosity of at least about 50,000 cps which includes the steps of:

(a) dissolving an unneutralized or neutralized sulfonated polymer in a solvent to form a solution, a concentration of said unneutralized or neutralized sulfonated polymer in said solution being about 0.1 to about 20 wt. %, a viscosity of said solution being less than about 20,000 cps; and

(b) adding about 5 to about 500 volume % water to said solution, said water being immiscible with said solvent and said solution, the viscosity of said solution or suspension increasing upon the addition of said water from less than 20,000 cps to greater than 50,000 cps.

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4,313,863

## MODIFICATION OF ACRYLAMIDE POLYMERS

Ryoji Handa, Yokosuka; Norimasa Yoshida, Yokohama; Jun Hosoda, Yokohama, and Akihisa Furuno, Yokohama, all of Japan, assignors to Nitto Chemical Industry Co. Ltd.; Mitsubishi Rayon Co., Ltd. and Diafloc Co., Ltd., all of Tokyo, Japan

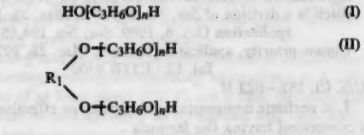
Filed Nov. 28, 1980, Ser. No. 211,294

Claims priority, application Japan, Nov. 30, 1979, 54/154459

Int. Cl.³ C08L 33/26

U.S. Cl. 260—29.6 E 8 Claims

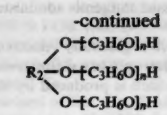
1. A method for modifying an acrylamide polymer with an inorganic alkaline substance by adding the inorganic alkaline substance to the hydrogel aggregates of the acrylamide polymer in a mixing tank to hydrolyze the polymer, characterized in that the mixing tank has a chromium-plated internal surface with which the hydrogel aggregates of the acrylamide polymer contact, and that at least one compound selected from the group consisting of the compounds represented by the following general formulae (I), (II) and (III):



(I)

(II)

-continued



(III)

wherein $R_1$ is a residue obtained by removing two OH groups from a saturated dihydric alcohol having 2 to 4 carbon atoms, and $R_2$ is a residue obtained by removing three OH groups from a trihydric alcohol having 3 to 6 carbon atoms, and n's are such numerical values that any of the compounds represented by the general formulae (I), (II) and (III) has an average molecular weight within the range of 500 to 5,000, is added to said hydrogel aggregates as an anti-tack agent.

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**4,313,864**

**POLYPHENYLENE OXIDE/PLASTICIZER/HYDROGENATED RADIAL TELEBLOCK COPOLYMER BLENDS**

**William R. Haaf, Voorheesville, and Gim F. Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.**

**Filed Jan. 21, 1980, Ser. No. 113,459**

**Int. Cl.³ C08L** *53/02, 71/04;* **C08K** *5/10, 5/52*

**U.S. Cl. 260—30.6 R** **13 Claims**

1. A thermoplastic molding composition having improved melt-flow characteristics and enhanced impact resistance characteristics, consisting essentially of an intimate admixture

(a) a polyphenylene ether resin present in an amount to provide no less than about 65% by weight of the total weight of the composition;

(b) a plasticizer composition selected from aromatic phosphates, alkyl adipates, alkyl phthalates or paraffinic oils; and

(c) a minor amount of a hydrogenated radial teleblock copolymer of a vinyl aromatic monomer and a saturated rubber.

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**4,313,865**

**INSTANT-SETTING ADHESIVE COMPOSITION**

**Toshio Teramoto, Yokohama; Noriaki Ijuin, Kawasaki, and Teizo Kotani, Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan**

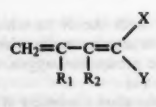
**Filed Sep. 23, 1980, Ser. No. 189,909**

**Claims priority, application Japan, Sep. 28, 1979, 54-125070**

**Int. Cl.³ C08K** *5/10*

**U.S. Cl. 260—31.4 R** **19 Claims**

1. An instant-setting adhesive composition comprising a 2-cyanoacrylate and at least one 1,1-disubstituted diene represented by the following general formula (A), the amount of said 1,1-disubstituted diene being more than 50% by weight but not more than 90% by weight based on the total amount of both components:



(A)

wherein $R_1$ is a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, an aryl group, an aralkyl group or a halogen atom, $R_2$ is a hydrogen atom or an alkyl group having 1 to 5 carbon atoms, and X and Y, which may be the same or different, are selected from the group consisting of cyano group, carboxylate group, ethylsulfone group, phenylsulfone group, formyl group, acetyl group, benzoyl group, diethylphosphonyl group, amido group and phenyl group.

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**4,313,866**

**PLASTICIZERS FOR VINYL CHLORIDE POLYMERS**

**James T. Renshaw, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.**

**Continuation-in-part of Ser. No. 972,762, Dec. 26, 1978, abandoned. This application May 19, 1980, Ser. No. 150,877**

**Int. Cl.³ C08K** *5/11;* **C08L** *27/06*

**U.S. Cl. 260—31.8 H** **21 Claims**

1. A plasticizer composition consisting essentially of, by weight, from about 50% to about 90% prime ester at least about 40 parts per hundred parts by weight of which is aromatic diester selected from alkyl benzyl succinates, glutarates and mixtures thereof in which said alkyl contains from about 3 to about 6 carbon atoms, up to about 20% essentially non-olefinic hydrocarbon boiling between about 200° and about 325° C. and from about 10% to about 50% non-aromatic diester having a molecular weight from about 230 to about 300.

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**4,313,867**

**LOW PRESSURE INJECTION MOLDABLE COMPOSITIONS**

**Ilan Duvdevani, Leonia, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Jan. 5, 1981, Ser. No. 222,615**

**Int. Cl.³ C08L** *91/00*

**U.S. Cl. 260—33.6 AQ** **12 Claims**

1. An elastomeric composition which comprises

(a) a styrene-ethylene/butylene-styrene block copolymer;

(b) about 10 to about 400 parts by weight of a neutralized sulfonated EPDM terpolymer per 100 parts by weight of the styrene-ethylene/butylene-styrene block copolymer, said sulfonated EPDM terpolymer being derived from an EPDM terpolymer having an Mn of about 10,000 to about 200,000, a Mooney viscosity [ML, 1+8] 212° F./and about 40 to about 75 wt. % of ethylene, of about 10 to about 53 wt. % of propylene and about 1 to about 10 wt. % of a conjugated diene;

(c) about 5 to about 180 parts by weight of an isotactic polypropylene homopolymer per 100 parts by weight of the styrene-ethylene/butylene-styrene block copolymer; and

(d) about 5 to about 300 parts by weight of a non-polar backbone process oil per 100 parts by weight of the styrene-ethylene/butylene-styrene block copolymer.

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**4,313,868**

**GLASS FILLED POLYAMIDE-IMIDE PHTHALAMIDE COPOLYMER**

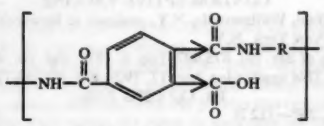
**Robert B. Hanson, Oswego, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Apr. 30, 1980, Ser. No. 145,334**

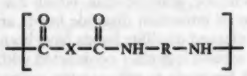
**Int. Cl.³ C08L** *77/10;* **C08G** *69/32, 73/14*

**U.S. Cl. 260—37 N** **9 Claims**

1. A polyamide molding composition suitable for injection molding comprising recurring polyamide A units of



capable of undergoing imidization wherein → denotes isomerization and polyamide B units of



wherein the molar ratio of A units to B units is about 80 to 20 to 20 to 80 and the molding composition contains from about 30 to 50 weight percent of glass fibers, glass beads or a mixture thereof and R is a divalent aromatic hydrocarbon radical of from 6 to about 20 carbon atoms or 2 divalent hydrocarbon radicals of from about 6 to about 20 carbon atoms joined directly or by stable linkages selected from the group consisting of —O—, methylene, —CO—, —$SO_2$— and —S— radicals and X is a divalent aromatic radical.

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4,313,869

## COMPOSITION FRICTION ELEMENT FOR A RAILROAD BRAKE SHOE

John B. Littlefield, Wheaton, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed May 19, 1980, Ser. No. 151,398
Int. Cl.[3] C08K 3/22; C08L 61/10
U.S. Cl. 260—38 3 Claims

1. A composite friction element for a railroad brake shoe and the like, said element having a bond of synthetic rubber selected from the group consisting of a butyl rubber, a styrene butadiene copolymer rubber, an acrylonitrile rubber, and a chlorinated butyl rubber, said rubber blended with a phenolic thermosetting resin, organic and carbon base fillers, reinforcing materials, and inorganic fillers, an improvement in said element comprising said inorganic fillers being present in said element in a percentage range by weight of about 25.0% to 65.0% and consisting in part of alumina trihydrate being present in said element in a percentage range by weight of about 5.0% to 25.0%.

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4,313,870

## PROCESS FOR PRODUCING POLYCONDENSATES

Shozaburo Imai, Akashi; Haruo Suzuki, Iberaki; Kuniaki Asai, Tondabayashi, and Katsuji Ueno, Hirakata, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 5, 1978, Ser. No. 939,794
Claims priority, application Japan, Sep. 21, 1977, 52-114042; Sep. 21, 1977, 52-114043
Int. Cl.[3] C08G 85/00, 63/06, 69/06
U.S. Cl. 260—40 R 10 Claims

1. In a method for producing a polycondensate by a bulk polycondensation of a monomer (or a reactant mixture) which is a fluid at the polycondensation temperature, an improvement which comprises carrying out the polycondensation until substantially the whole polycondensate becomes a solid polydispersion while continually applying a shearing force sufficient for maintaining the polycondensation system in polydispersed state at a temperature below the sintering temperature of the produced polycondensate but sufficiently high for allowing the polycondensation to proceed substantially.

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4,313,871

## ANTIGEN FOR EARLY PREGNANCY TEST AND CONTRACEPTIVE VACCINE

Om P. Bahl, Williamsville, N.Y., assignor to Research Corporation, New York, N.Y.

Division of Ser. No. 875,497, Feb. 6, 1978, Pat. No. 4,234,561. This application Apr. 17, 1979, Ser. No. 30,773
Int. Cl.[3] C07G 7/00
U.S. Cl. 260—112 B 30 Claims

1. An antigen which is capable of being administered to a host animal to induce an antibody response which is generally selective to human chorionic gonadotropin to a distinquishing degree from luteinizing hormone, which comprises a $\beta$-subunit of human chorionic gonadotropin which has been reduced such that four of intrachain disulfide bonds are cleaved, and wherein said cleaved disulfide bonds have been alkylated, and wherein said subunit is further conjugated with a protein or a hapten which functions to enhance the antibody response to said antigen when the said antigen is administered to said host animal.

9. An antiserum which is generally selective in reactivity to human chorionic gonadotropin to a distinguishing degree from luteinizing hormone, which is produced by the process comprising:

isolating the $\beta$-subunit of human chorionic gonadotropin, reducing and cleaving three of the intrachain disulfide bonds of said $\beta$-subunit, alkylating the thus reduced intrachain disulfide groups, and conjugating said $\beta$-subunit with a protein or hapten selected from the group coasisting of albumin, hemocyanin, thyroglobulin, and muramyl alanyl isoglutamine, either of said reducing, cleaving, and alkylating, and said conjugating being performed first,

isolating said antigen,

administering said antigen to a host animal whereby said animal generates an antibody response to said antigen,

and extracting said antiserum from said animal.

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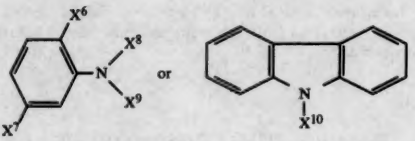
4,313,872

## AZO COUPLING IN TWO-PHASE WATER-ALCOHOL MIXTURES

Ernst Heinrich, Neu-Isenburg, and Joachim Ribka, Offenbach am Main-Bürgel, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main Fechneheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 762,931, Jan. 26, 1977, abandoned. This application May 8, 1978, Ser. No. 904,107
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1976, 2603836; May 20, 1977, 2722768
Int. Cl.[3] C09B 29/01, 29/06, 29/24, 29/36
U.S. Cl. 260—152 12 Claims

1. In the process of preparing an azo dye by coupling a diazonium compound in aqueous solution with a coupling compound having the formula




where

$X^6$ is selected from the class consisting of hydrogen, halogen, alkyl of up to four carbons, and alkoxy of up to four carbons;

$X^7$ is selected from the class consisting of $X^6$ and alkylcarbonylamino of up to 8 carbons in the alkyl moiety;

$X^8$ and $X^9$ are independently unsubstituted or monosubstituted alkyl, the substitution being selected from the class consisting of halogen, hydroxy, cyano, alkyl-carbonyloxy, alkoxy, alkoxy-carbonyl, alkoxy-carbonyloxy, phenoxycarbonyl, phenoxy-carbonyloxy, cyclohexyl, phenyl, halophenyl, alkylphenyl, phenoxy, halophenoxy and alkylphenoxy, each alkyl and alkoxy having up to four carbons; or

$X^8$ and $X^9$ together with the N to which they are both bonded form a heterocyclic ring in which the N is linked through methylene groups to oxygen, another N, or an additional carbon; and

$X^{10}$ is selected from the class consisting of hydrogen and $X^8$

at a temperature between about 0° and 80° in the presence of an acid, the improvement which comprises effecting the coupling essentially in a twophase mixture of water and a simple alkanol having four to six carbons in the molecule and soluble in water to the extent of not over about 15% by weight at 15° C., the mixture containing from about 15 to about 90% alkanol by weight, and then directly separating the dye in over 85% purity from the reaction mixture.

4,313,873

## NOVEL METHOD FOR REDUCING THE PROCESSING TEMPERATURE OF THERMOPLASTIC POLYMERS

In C. Lim, Pittsburgh, Pa., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 921,529, Jul. 3, 1978. This application Jun. 18, 1979, Ser. No. 49,834

Int. Cl.³ C08L *91/00*

U.S. Cl. 260—18 TN 6 Claims

1. A method for reducing the processing temperature of a thermoplastic polycarbonate comprising blending the thermoplastic polycarbonate in powder form having a maximum particle size diameter of less than about 1000 microns with an effective amount of a compound having a softening temperature of about 20° to 200° C. lower than the softening temperature of the thermoplastic polycarbonate.

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4,313,874

## DISPERSE MONOAZO DYESTUFFS

Violet Boyd; Brian R. Fishwick, both of Manchester, England, and Brian Glover, Charlotte, N.C., assignors to Imperial Chemical Industries Limited, London, England

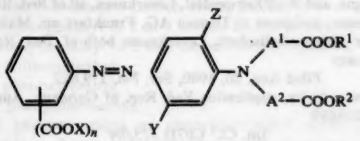
Continuation of Ser. No. 666,248, Mar. 12, 1976, abandoned. This application Apr. 4, 1977, Ser. No. 784,330

Claims priority, application United Kingdom, Mar. 25, 1975, 12417/75

Int. Cl.³ C07C *107/06;* C09B *29/085, 29/26*

U.S. Cl. 260—207 3 Claims

1. A disperse monazo dyestuff of the formula:



wherein X is lower alkyl, n is 1, 2 or 3, Z is hydrogen, lower alkyl or lower alkoxy, Y is lower alkylcarbonylamino, $A^1$ and $A^2$ are each independently lower alkylene, and $R^1$ and $R^2$ are each independently lower alkyl or hydroxyalkyl containing from 2 to 4 carbon atoms.

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4,313,875

## PURIFICATION OF PENICILLIN DERIVATIVE

Etsumi Nakamura, Toyonaka; Takashi Suzuki, Kawanishi; Tadasu Yanagida, Toyonaka, and Minehiko Yamamura, Itami, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Aug. 27, 1980, Ser. No. 181,750

Claims priority, application Japan, Sep. 11, 1979, 54-117030

Int. Cl.³ C07D *499/68*

U.S. Cl. 260—239.1 17 Claims

1. A method for purification of crude 6-[D-2-(D-2-amino-3-N-methylcarbamoyl-propionamido)-2-p-hydroxy-phenylacetamido]penicillanic acid which comprises the steps of:

(A) contacting an aqueous solution of 6-[D-2-(D-2-amino-3-N-methylcarbamoyl-propionamido)-2-p-hydroxy-phenylacetamido]penicillanic acid with a nonpolar, macroporous styrenedivinylbenzyl copolymer adsorption resin to absorb 6-[D-2-(D-2-amino-3-N-methylcarbamoyl-propionamido)-2-p-hydroxyphenylacetamido]penicillanic acid on the resin,

(B) eluting the absorbed 6-[D-2-(D-2-amino-3-N-methylcarbamoylpropionamido)-2-p-hydroxyphenylacetamido]-penicillanic acid with water or a mixture of water and a water-miscible organic solvent,

and then

(C) isolating pure 6-[D-2-(D-2-amino-3-N-methylcarbamoylpropionamido)-2-p-hydroxyphenylacetamido]-penicillanic acid from the eluates.

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4,313,876

## PRODUCTION OF ISOPHORONEDIISOCYANATE ADDUCTS CONTAINING FREE NCO-GROPS AND NCO-GROUPS END BLOCKED WITH ε-CAPROLACTAM

Rainer Gras, and Elmar Wolf, both of Herne, Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jul. 1, 1980, Ser. No. 165,206

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1979, 2929224

Int. Cl.³ C07D *223/10*

U.S. Cl. 260—239.3 R 5 Claims

1. A method for producing isophoronediisocyanate adducts containing free NCO- and NCO-groups end blocked with ε-caprolactam, wherein the isophoronediisocyanate adducts and ε-caprolactam are mixed in such a proportion that 0.1–1 mole of NCO-groups remain free per mole of isophoronediisocyanate adduct wherein said adducts are selected from the group consisting of:

trimerized isophoronediisocyanate alone or in a mixture with monomer isophoronediisocyanate and having an NCO-content of 17–35% by weight,

isophoronediisocyanate containing urea groups and having an NCO-content of 22–35% by weight,

isophoronediisocyanate containing biuret groups and having an NCO-content of 20–35% by weight,

isophoronediisocyanate containing carbodiimide groups and having an NCO-content of 22–35% by weight, and

an isophoronediisocyanate adduct exhibiting urea and urethane groups of 1-hydroxy-3-aminomethyl-3,5,5-trimethylcyclohexane and isophoronediisocyanate.

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4,313,877

## 11A-METHANO $TXA_2$ AMIDES

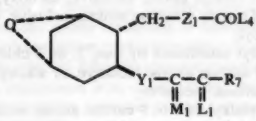
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 35,143, May 1, 1979, Pat. No. 4,218,378. This application Jan. 28, 1980, Ser. No. 116,115

Int. Cl.³ C07D *305/14, 405/02, 407/02*

U.S. Cl. 260—333 3 Claims

1. A thromboxane analog of formula IV



wherein $Y_1$ is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) $—CH_2CH_2—$, or

(4) —C≡C—,

wherein $M_1$ is α—$R_5$:β—OH, α—OH:β—$R_5$, or α—H:β—H, wherein $R_5$ is hydrogen or methyl, and wherein $L_1$ is α—$R_3$:β—$R_4$, α—$R_4$:β$R_3$, or a mixture of α—$R_3$:β—$R_4$ and β—$R_3$:α—$R_4$, wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro, or wherein —$C(M_1)$—$C(L_1)$— is trans—CH=CH—;

wherein $Z_1$ is

(1) cis—CH=CH—$CH_2$—$(CH_2)_5$—$CH_2$—,

(2) cis—CH=CH—$CH_2$—$(CH_2)_5$—$CF_2$—,

(3) cis—$CH_2$—CH=CH—$(CH_2)_5$—$CH_2$—,

(4) —$(CH_2)_3$—$(CH_2)_5$—$CH_2$—,

(5) —$(CH_2)_3$—$(CH_2)_5$—$CF_2$—,

(6) —$CH_2$—O—$CH_2$—$(CH_2)_5$—$CH_2$—,

(7) —$(CH_2)_2$—O—$(CH_2)_5$—$CH_2$—,

(8) trans—$CH_2$—$(CH_2)_g$—$CH_2$—CH=CH—,
(9) —(m—Ph)—O—$(CH_2)_g$—, or
(10) —(m—Ph)—$CH_2$—$(CH_2)_g$—,
wherein g is one, 2, or 3 and —(m—Ph)— is meta-phenylene;
wherein $R_7$ is
(1) —$(CH_2)_m$—$CH_3$, wherein m is an integer from one to 5, inclusive;
(2) phenoxy;
(3) phenoxy substituted by one, two or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(4) phenyl;
(5) phenyl substituted by one, two or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(6) phenylmethyl, phenylethyl, or phenylpropyl; or
(7) phenylmethyl, phenylethyl, or phenylpropyl substituted by one, two or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl; with the proviso that $R_7$ is phenoxy or substituted phenoxy, only when $R_3$ and $R_4$ are hydrogen or methyl, being the same or different; and
wherein $L_4$ is
(a) amino of the formula —$NR_{21}R_{22}$, wherein $R_{21}$ and $R_{22}$ are
(i) hydrogen;
(ii) alkyl of one to 12 carbon atoms, inclusive;
(iii) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(iv) aralkyl of 7 to 12 carbon atoms, inclusive;
(v) phenyl;
(vi) phenyl substituted with one, 2, or 3 chloro, alkyl of one to three carbon atoms, inclusive, hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(vii) carboxyalkyl of 2 to 4 carbon atoms, inclusive;
(viii) carbamoylalkyl of 2 to 5 carbon atoms, inclusive;
(ix) cyanoalkyl of 2 to 5 carbon atoms, inclusive;
(x) acetylalkyl of 3 to 6 carbon atoms, inclusive;
(xi) benzoylalkyl of 7 to 11 carbon atoms, inclusive;
(xii) benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(xiii) pyridyl;
(xiv) pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive;
(xv) pyridylalkyl of 6 to 9 carbon atoms, inclusive;
(xvi) pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy or alkoxy of one to 3 carbon atoms, inclusive;
(xvii) hydroxyalkyl of one to 4 carbon atoms, inclusive;
(xviii) dihydroxyalkyl of one to 4 carbon atoms, or
(xix) trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of $R_{21}$ and $R_{22}$ is other than hydrogen or alkyl;
(b) cycloamino selected from the group consisting of
(i) pyrrolidino,
(ii) piperidino,
(iii) morpholino,
(iv) piperazino,
(v) hexamethyleneimino,
(vi) pyrrolino,
(vii) 3,4-didehydropiperidinyl, or
(viii) pyrrolidino, piperidino, morpholino, piperazino, hexamethyleneimino, pyrrolino, or 3,4-didehydropiperidinyl substituted by one or two alkyl of one to 12 carbon atoms, inclusive;
(c) carbonylamino of the formula —$NR_{23}COR_{21}$, wherein $R_{23}$ is hydrogen or alkyl of one to 4 carbon atoms and $R_{21}$ is other than hydrogen, but otherwise as defined above; or
(d) sulfonylamino of the formula —$NR_{23}SO_2R_{21}$, wherein $R_{21}$ and $R_{23}$ are as defined in (c).

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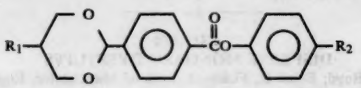
**4,313,878**

## 4-SUBSTITUTED PHENYL 4'-(5-N-ALKYL-1,3-DIOXAN-2-YL)BENZOATES

**Ying Y. Hsu, Los Altos, Calif., assignor to Timex Corporation, Waterbury, Conn.**

**Filed Dec. 3, 1980, Ser. No. 212,303**
**Int. Cl.³ C07D *319/04***
**U.S. Cl. 260—340.7** **6 Claims**

1. A compound of the formula:



where $R_1$ is an alkyl group and $R_2$ is an alkyl, alkoxy, acyloxy, alkyl carbonato group having 1 to 10 carbon atoms, CN or $NO_2$.

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**4,313,879**

## PROCESS FOR THE MANUFACTURE OF VERY PURE ε-CAPROLACTONE

**Herbert Klenk; Rolf Wirthwein, both of Hanau; Gerd Siekmann, Cologne, and Wulf Schwerdtel, Leverkusen, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt am Main and Bayer Aktiengesellschaft, Leverkusen, both of, Fed. Rep. of Germany**

**Filed Aug. 20, 1980, Ser. No. 179,622**
**Claims priority, application Fed. Rep. of Germany, Aug. 28, 1979, 2934659**
**Int. Cl.³ C07D *313/04***
**U.S. Cl. 260—343** **9 Claims**

1. Process for the production of ε-caprolactone having a purity of 99.9% which comprises feeding ε-caprolactone, which has been made by reacting cyclohexanone with a solution of a percarboxylic acid, into a first distillation unit, which is operated at a pressure of 0.1 to 500 mbars and at the top of which unit the temperature is set in the range from 10° C. (when the pressure is 0.1 mbar) to 190° C. (when the pressure is 500 mbar), drawing off as the top product a mixture consisting of ε-caprolactone and lower-boiling impurities, feeding the bottom product of said first distillation unit into a second distillation unit, which is operated at a pressure of 0.1 to 500 mbars and at the top of which unit the temperature is set in the range from 15° C. (when the pressure is 0.1 mbar) to 210° C. (when the pressure is 500 mbar), then drawing off the pure ε-caprolactone as the top product, the double distillation being carried out so that the reflux ratio in said first distillation unit being set at 0.5 to 200 and the reflex ratio is said second distillation unit being lower than that set for the first distillation unit and set at 0.1 to 5:1.

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**4,313,880**

## EXTRACTIVE PROCESS FOR PREPARING APIGENIN

**Claudio Redaelli, Missaglia, Italy, assignor to Benomelli S.p.A., Dolzago, Italy**

**Filed Nov. 27, 1979, Ser. No. 87,932**
**Claims priority, application Italy, Oct. 25, 1978, 29099 A/78**
**Int. Cl.³ C07D *311/30***
**U.S. Cl. 260—345.2** **2 Claims**

1. A process for preparing very pure apigenin for therapeutic use, wherein the ligules of Matricaria Chamomilla L. are extracted continuously for 7–8 hours with a water/ethanol mixture containing at least 30% by volume of ethanol; the extract is evaporated to dryness and taken up in a volume of

ether in the ratio of about 10 parts by volume to 1 part by weight of the initial ligules, and is kept under strong agitation for about 24 hours at ambient temperature; the precipitated solid is hydrolysed with 10% HCl by heating under reflux for about 10 hours.

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4,313,881

## 5-HYDROXYFUROCHROMONES

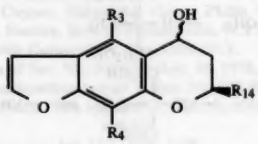
**Ronald B. Gammill, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 116,322, Jan. 28, 1980, Pat. No. 4,284,569, which is a continuation-in-part of Ser. No. 11,816, Feb. 13, 1979, abandoned. This application Oct. 29, 1980, Ser. No. 201,845**

**Int. Cl.³ C07D *311/78***

**U.S. Cl. 260—345.2** **5 Claims**

1. A furochromone of formula X



wherein $R_{14}$ is:

(a) hydrogen;

(b) alkyl of one to 8 carbon atoms, inclusive;

(c) alkoxymethyl of 2 to 8 carbon atoms, inclusive;

(d) alkylthioalkyl of 2 to 8 carbon atoms, inclusive;

(e) trifluoromethyl;

(f) phenoxymethyl;

(g) phenylthiomethyl;

(h) phenoxymethyl or phenylthiomethyl substituted by chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms or alkoxy of one to 3 carbon atoms; or

(i) cycloalkyl of 3 to 10 carbon atoms, inclusive; and

wherein one of $R_3$ and $R_4$ is methoxy and the other is methoxy or hydrogen.

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4,313,882

## 7-METHYL-6-METHYLTHIO-, METHYLSULFINYL-, AND METHYLSULFONYL-METHYL-FUROCHROMONES

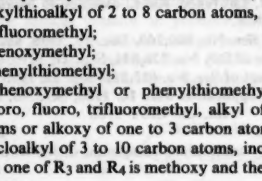
**Ronald B. Gammill, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 116,322, Jan. 28, 1980, Pat. No. 4,284,569, which is a continuation-in-part of Ser. No. 11,816, Feb. 13, 1979, abandoned. This application Oct. 29, 1980, Ser. No. 201,852**

**Int. Cl.³ C07D *311/78***

**U.S. Cl. 260—345.2** **7 Claims**

1. A furochromone of formula LIV



LIV

wherein $R_{11}$ is $-CH_2SR_{10}$, or $-CH_2SOR_{10}$, or $-CH_2(SO_2)R_{10}$, wherein $R_{10}$ is alkyl of one to 5 carbon atoms, inclusive; and

wherein one of $R_3$ and $R_4$ is methoxy and the other is methoxy or hydrogen.

4,313,883

## HALOFUROCHROMONES

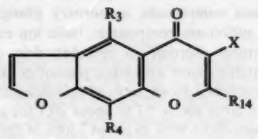
**Ronald B. Gammill, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 116,322, Jan. 28, 1980, Pat. No. 4,284,569, which is a continuation-in-part of Ser. No. 11,816, Feb. 13, 1979, abandoned. This application Oct. 29, 1980, Ser. No. 201,933**

**Int. Cl.³ C07D *311/78***

**U.S. Cl. 260—345.2** **9 Claims**

1. A furochromone of formula VI



wherein $R_{14}$ is:

(a) hydrogen;

(b) alkyl of one to 8 carbon atoms, inclusive;

(c) alkoxymethyl of 2 to 8 carbon atoms, inclusive;

(d) alkylthioalkyl of 2 to 8 carbon atoms, inclusive;

(e) trifluoromethyl;

(f) phenoxymethyl;

(g) phenylthiomethyl;

(h) phenoxymethyl or phenylthiomethyl substituted by chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms or alkoxy of one to 3 carbon atoms; or

(i) cycloalkyl of 3 to 10 carbon atoms; inclusive;

wherein one of $R_3$ and $R_4$ is methoxy and the other is methoxy or hydrogen; and

wherein X is chloro, iodo, or bromo.

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4,313,884

## USE OF METAL IONS IN PREPARATION OF ANHYDROPOLYOLS

**Blaise J. Arena, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Jan. 21, 1980, Ser. No. 113,882**

**Int. Cl.³ C07D *309/06, 307/12, 305/04***

**U.S. Cl. 260—345.9 R** **10 Claims**

1. A method of preparing anhydropolyols from polyols selected from the group consisting of hexitols, pentitols and tetritols which comprises contacting said polyol with a source of metal ions selected from the group consisting essentially of magnesium, manganese, iron, cobalt, nickel, copper, actinium, thorium, protactinium, uranium, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium and lutetium at a temperature of from about 100° C. to about 300° C., and recovering said anhydropolyols.

5. A method of preparing anhydrohexitols from a hexose comprising hydrogenating the hexose in the presence of metal ions whose charge to ionic radius ratio is from about 2.0 to about 3.2 at a temperature from about 80° to about 250° C., and recovering the anhydrohexitols formed thereby.

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4,313,885

## FURFURYL THIOUREA COMPOUNDS

**Pamela K. Baker, Hopewell; Goro Asato, Titusville, both of N.J., and John Dusza, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.**

**Filed May 21, 1980, Ser. No. 152,269**

**Int. Cl.³ C07D *307/52***

**U.S. Cl. 260—347.2** **9 Claims**

1. The compound 1-furfuryl-2-thio-3-(2,6-xylyl)urea.

4,313,886

## PROCESS FOR PREPARING LIQUID EPOXY RESINS

John L. Massingill, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 25, 1980, Ser. No. 190,700
Int. Cl.³ C07D 301/28
U.S. Cl. 260—348.15 4 Claims

1. A process for preparing liquid diglycidyl ethers of dihydric phenols which process comprises:

(A) reacting in a first reactor in the presence of a suitable quantity of a suitable catalyst selected from quaternary ammonium compounds, quaternary phosphonium compounds, sulfonium compounds, basic ion exchange resins and mixtures thereof, an epihalohydrin or mixture of epihalohydrins with a dihydric phenol or mixture of dihydric phenols in a molar ratio of epihalohydrin to dihydric phenol of from about 5:1 to about 20:1 for a time amounting to from about 90% to about 110% of the time required for the reaction mixture to reach equilibrium;

(B) subjecting the reaction mixture produced in said first reactor to flash distillation so as to remove epihalohydrin and glycerin dihalohydrin therefrom;

(C) contacting the distlilland from step (B) in a subsequent reactor in the presence of a suitable catalyst as aforementioned with an epihalohydrin in a weight ratio of epihalohydrin to distilland of from about 1:1 to about 20:1 for a time amounting to from about 90% to about 110% of the time required for the reaction mixture to reach equilibrium;

(D) repeating steps (B) and (C) until the distilland contains less than about 1000 ppm, hydrolyzable halide; and

(E) thereafter removing any residual quantities of catalyst therefrom.

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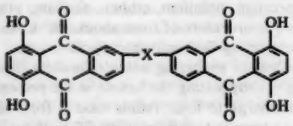
4,313,887

## BIS-QUINIZARIN COMPOUNDS

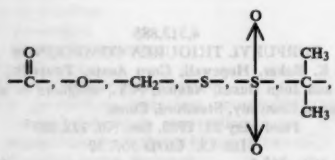
Clarence D. Bertino; Robert W. Hill, both of Houston, Tex., and J. Gustav Schulz, Pittsburgh, Pa., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 121,547, Feb. 14, 1980, abandoned. This application Oct. 29, 1980, Ser. No. 201,874
Int. Cl.³ C07C 49/74
U.S. Cl. 260—367 4 Claims

1. A bis-quinizarin compound having the structure:



where X is



—$CF_2$—, or a direct bond.

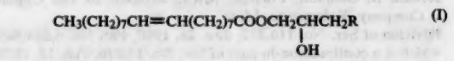
4,313,888

## N-3-(CIS-9-OCTADECENOYLOXY)-2-HYDROXY-PROPYLAMINE DERIVATIVE

Keiichi Honda, Odawara, and Yasushi Nishijima, Kamakura, both of Japan, assignors to Kanebo Ltd., Tokyo, Japan

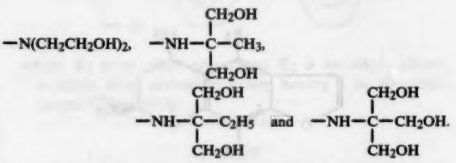
Filed Sep. 15, 1980, Ser. No. 187,045
Int. Cl.³ C09F 5/00; B01F 17/30
U.S. Cl. 260—404 7 Claims

1. A N-3-(cis-9-octadecenoyloxy)-2-hydroxypropylamine derivative of the general formula (I):



(I)

wherein R represents a member selected from the group consisting of



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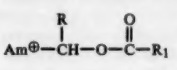
4,313,889

## SOFT QUATERNARY SURFACE ACTIVE AGENTS

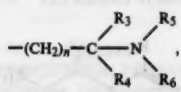
Nicolae S. Bodor, Lawrence, Kans., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 969,260, Dec. 13, 1978, abandoned, which is a division of Ser. No. 726,841, Sep. 27, 1976, which is a continuation-in-part of Ser. No. 615,519, Sep. 22, 1975, Pat. No. 3,989,711. This application Jun. 10, 1980, Ser. No. 158,316
Int. Cl.³ C09F 5/00
U.S. Cl. 260—404 50 Claims

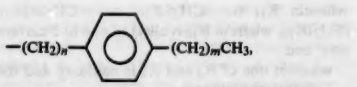
1. A quaternary ammonium compound of the formula:



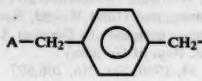
wherein Am is a tertiary aliphatic amine; wherein R represents a member selected from the group consisting of hydrogen, $C_1$–$C_{20}$ alkyl, cycloalkyl having up to 7 carbon atoms, alkoxyalkyl having up to 20 carbon atoms, $C_1$–$C_{20}$ haloalkyl, carboxyalkyl having up to 20 carbon atoms, phenyl, naphthyl, substituted phenyl and substituted naphthyl whose substituents are selected from the group consisting of halogen, O—$C_1$–$C_4$ alkyl, O—$C_1$–$C_8$ acyl wherein said acyl group is derived from a carboxylic acid, nitro, carboxyl, and carboethoxy; wherein $R_1$ represents $C_9$–$C_{22}$ straight or branched alkyl,



wherein $R_3$, $R_4$, $R_5$ and $R_6$ are each selected from the group consisting of hydrogen, methyl, and ethyl, $C_9$–$C_{22}$ straight or branched alkyl



wherein n in each occurrence and m represents an integer of from 0 to 22,



wherein A is selected from the group consisting of $C_0$–$C_{22}$ straight or branched alkyl and $-(CH_2CH_2O)_p$, wherein the p represents an integer of from 0 to 22, and the radical which results from decarboxylation of a naturally occurring bile acid; and wherein x is a nontoxic, pharmaceutically acceptable anion.

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## 4,313,890
## POLYOL ESTER FUNCTIONAL FLUIDS

**Nan S. Chu, Hartsdale; Nye A. Clinton, Brewster, both of N.Y.; Robert A. Cupper, Ridgefield, Conn.; Philip F. Wolf, and Priscilla B. Stanley, both of Pleasantville, N.Y., assignors to Union Carbide Corporation, New York, N.Y.**

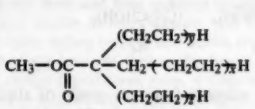
**Continuation of Ser. No. 920,832, Jun. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 782,598, Mar. 30, 1977, abandoned. This application Jan. 29, 1980, Ser. No. 116,618**

**Int. Cl.³ C09F *5/08***

**U.S. Cl. 260—410.6** **10 Claims**

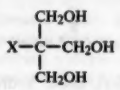
1. A process for the preparation of a highly substituted polyol ester containing essentially no unreacted formate bonds wherein said process comprises:

(a) reacting ethylene with methyl formate in the presence of a free radical initiator to produce a mixture of linear methyl esters (I), linear α-alkyl methyl esters (II) and linear α,α-dialkyl methyl esters (III) wherein (I) and (II) and (III) are represented by the general formula:



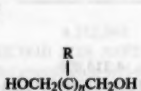
wherein X is an integer having values of 1 to about 60; y and z are each integers having values ≧0 with the proviso that the sum (x+y+z)≦60;

(b) transesterifying the mixture of esters I, II and III with at least one polyol selected from the group consisting of:



(1)

wherein X is $-CH_2OH$, alkyl having 1 to about 12 carbon atoms or aryl or aralkyl groups having 6 to about 10 carbon atoms;



(2)

wherein n is an integer having values of 0 to 6 and each of R and R′ is H or alkyl having 1 to about 12 carbon atoms; or

(3) anhydro products of (1) or (2) containing 1 to about 5 ether linkages formed by the condensation of two or more $-CH_2OH$ groups with the elimination of $H_2O$ from at least one pair of $-CH_2OH$ groups, such that the resultant polyol ester consists essentially of polyol esters derived from esters (I) and (II) and untransesterified ester (III);

(c) removing excess ethylene and methyl formate from the mixture of step (b);

(d) collecting a highly substituted polyol ester wherein said polyol ester is essentially free of unreacted formate bonds.

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## 4,313,891
## PROCESS FOR SYNTHESIZING MIXED ALKOXY HYDRIDE DERIVATIVES OF ALUMINIUM AND ALKALINE EARTH METALS

**Giovanni Dozzi, Milan, and Salvatore Cucinella, San Donato Milanese, both of Italy, assignors to Anic S.p.A., Palermo, Italy**

**Filed Oct. 26, 1979, Ser. No. 88,581**

**Claims priority, application Italy, Nov. 10, 1978, 29699 A 78; Apr. 4, 1979, 21564 A79**

**Int. Cl.³ C07F *5/06***

**U.S. Cl. 260—448 AD** **7 Claims**

1. A process for synthesising compounds of aluminium and alkaline earth metals containing hydride hydrogens and alkoxy radicals, of composition

$$M[AlH_{4-n}(OR)_n]_2 \cdot xB$$

in which $0.5 \leqq n \leqq 3.5$; OR is an alkoxy radical derived from a primary, secondary or tertiary alcohol; R is an aliphatic, cycloaliphatic or aromatic hydrocarbon radical; M is an alkaline earth metal; B is a Lewis base; x can vary between 0 and 4; and R can also contain functional groups OR′, SR′, NR′$_2$, consisting of reacting together:

(a) a halide of an alkaline earth metal;

(b) an alanate of an alkaline earth metal of formula $M'AlH_4$ (M′=alkaline metal);

(c) an alcohol chosen from primary, secondary or tertiary aliphatic, cycloaliphatic or aromatic alcohols containing 1 to 20 carbon atoms.

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## 4,313,892
## N-(SULFENYL) PHTHALAMIDES

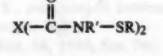
**Alfred B. Sullivan, Wadsworth, and Raleigh W. Wise, Akron, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.**

**Division of Ser. No. 33,653, Apr. 26, 1979. This application Mar. 31, 1980, Ser. No. 135,593**

**Int. Cl.³ C07C *83/10***

**U.S. Cl. 260—453 RW** **13 Claims**

1. A compound of the formula



in which X is phenylene and R and R′ are the same or different radicals selected from the group consisting of alkyl of 1–20 carbon atoms, cycloalkyl of 5–12 carbon atoms, phenyl or mono- or di-substituted phenyl wherein the substituents are lower alkyl, lower alkoxy or halo, or R′ is hydrogen, when X is 1,2-phenylene R′ is one of the above defined radicals and when X is 1,3-phenylene or 1,4-phenylene R′ is one of the above defined radicals or hydrogen.

4,313,893

## CARBONYLATION OF OLEFINICALLY UNSATURATED COMPOUNDS

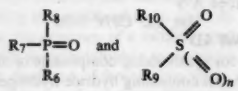
Frederick A. Pesa, Aurora, and Thomas A. Haase, Twinsburg, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 973,069, Dec. 26, 1978, abandoned. This application Oct. 31, 1979, Ser. No. 89,822

Int. Cl.[3] C07C *120/00, 121/417, 121/34*

U.S. Cl. 260—465.4 12 Claims

1. A process for the production of esters, acetals, ethers, amides and mixtures thereof, wherein the branched ester or amide product predominates comprising contacting an olefinically unsaturated compound in the liquid phase at a temperature in the range of about 50° C. to about 150° C. and a pressure in the range of about 100 psi to about 2500 psi with carbon monoxide and a compound containing a replaceable hydrogen atom in the presence of a catalyst comprising at least one of cobalt carbonyl and ruthenium carbonyl and a promoter ligand having one of the following structures:



wherein $R_6$, $R_7$, $R_8$, $R_9$ and $R_{10}$ are each independently selected from:

(1) $C_{1\text{-}10}$ alkyl;

(2) polynuclear aryls containing up to 10 carbon atoms, optionally substituted with $C_{1\text{-}10}$ alkyls; and

(3) $O(CH_2)_tCH_3$, wherein t is 0-10; and

wherein n is 0 or 1;

wherein the olefinically unsaturated compound has the following structure:

wherein $R_{11}$ and $R_{12}$ are each independently selected from:

(1) hydrogen (either $R_{11}$ or $R_{12}$ but not both);

(2) $C_{1\text{-}30}$ alkyl;

(3) $-(CH_2)_p-CN$, wherein p is 0-3; and

(4) $-(CH_2)_q-OR_3$, wherein q is 1-30 and $R_3$ is hydrogen or methyl;

with the proviso that at least one of $R_{11}$ and $R_{12}$ contains a nitrile moiety;

wherein the compound containing a replaceable hydrogen atom is represented by the following formula:

wherein Y is selected from the group consisting of:

(1) $OR_{14}$ wherein $R_{14}$ is a $C_{1\text{-}30}$ alkyl;

(2)

wherein $R_{15}$ and $R_{16}$ are each independently selected from $C_{1\text{-}10}$ alkyls; and

(3) H;

wherein the molar ratio of the compound containing a replaceable hydrogen atom to the olefinically unsaturated compound is about 0.5:1 to about 100:1 and the molar ratio of the promoter ligand to the cobalt carbonyl and ruthenium carbonyl is about 0:11 to about 50:1.

4,313,894

## PROCESS FOR THE PRODUCTION OF 3-CYANOPROPIONAMIDE

Axel Kleemann, Hanau; Wolfgang Leuchtenberger, Bruchkobel; Jürgen Martens, Alzenau, and Horst Weigel, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Nov. 14, 1980, Ser. No. 206,897

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1979, 2947475

Int. Cl.[3] C07C *120/02*

U.S. Cl. 260—465.4 11 Claims

1. A process for the production of 3-cyanopropionamide comprising reacting hydrocyanic acid with acrylamide at a temperature between 20° and 150° C. in the presence of an aprotic organic solvent and an alkali metal cyanide.

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4,313,895

## ALKOXYLATED DIQUATERNARY AMMONIUM COMPOUNDS

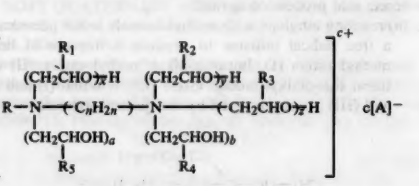
James M. Richmond, Naperville; Richard A. Reck, Hinsdale, and Gary A. Bernard, Bolingbrook, all of Ill., assignors to Akzona Incorporated, Asheville, N.C.

Filed Jun. 24, 1980, Ser. No. 162,570

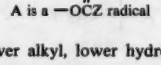
Int. Cl.[3] C07C *91/26;* C08L *95/00*

U.S. Cl. 260—501.15 7 Claims

1. A compound of the formula



wherein R is selected from the group of aliphatic radicals containing from about 6 to about 22 carbon atoms; n is an integer of from 2 to 6; $R_1$, $R_2$, $R_3$, $R_4$ and $R_5$ are independently selected from the group consisting of hydrogen, methyl and ethyl; x, y and z are independently integers of from 1 to 50; a and b are independently 0 or 1, provided that the sum of a+b is greater than zero; c is the sum of a+b; and



wherein Z is a lower alkyl, lower hydroxy alkyl or lower chloroalkyl.

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4,313,896

## ARYLOXYPHENYLPROPYLAMINES

Bryan B. Molloy, North Salem, and Klaus K. Schmiegel, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 872,148, Jan. 25, 1978, which is a division of Ser. No. 432,379, Jan. 10, 1974. This application Mar. 9, 1981, Ser. No. 241,913

Int. Cl.[3] C07C *93/06*

U.S. Cl. 260—501.18 4 Claims

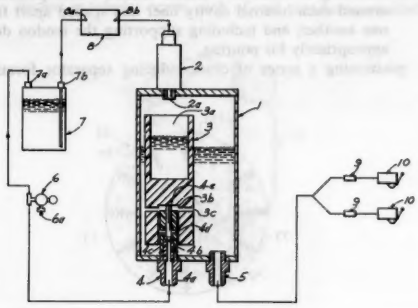
1. 3-Phenyl-3-(p-trifluorophenoxy)propylamine, and its acid addition salts formed with pharmaceutically acceptable acids.

4,313,897

## GAS AND LIQUID ADMIXING SYSTEM

Bruce Garrard, 126 Montgomery Ferry Dr. NE., Atlanta, Ga. 30309

Filed Jan. 30, 1980, Ser. No. 116,832
Int. Cl.³ B01F 3/04
U.S. Cl. 261—64 D 7 Claims



1. A system for carbonating water concurrently with carbonated water being drawn from the system, comprising a carbonating tank, a water supply source connected to said tank, a gas supply source connected to said tank, and drawing means connected to said tank for dispensing carbonated water, a float member within said tank responsive to the level of liquid in the tank, a gas inlet valve connected to said gas source and mounted in a wall of said tank, mechanical connection means within said tank connecting said float member with said gas inlet valve, said valve including a needle member and an orifice member, a decrease in said liquid level providing a gravitational force on said float member, said connection means conveying said force from said float member to said needle member to bias said needle member against said orifice member increasingly with a falling level of said liquid, thereby reducing the flow rate of gas into the tank as the liquid level falls and increasing it as the liquid level rises, a flow of water being induced into the tank during a draw of liquid from the tank which increases with a reduction of liquid level in the tank and decreased gas flow into the tank, said water flow decreasing with a rising liquid level and increased gas flow rate into the tank, an equilibrium point being reached at an intermediate level of liquid in the tank, with the liquid at an intermediate point on the float member, wherein the inlet flow rates of gas and water are continuously controlled to substantially equal the outlet flow rates of gas and water contained in the departing mixture of carbonated water, thus maintaining the liquid level at a constant point in the tank and at a constant level on the float member during a draw of carbonated water at a constant rate, and maintaining a constant and even mixing of gas and water as they enter the tank with constant flow rates and under constant conditions of gas pressure in the tank, during said draw.

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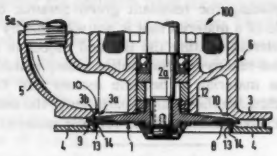
4,313,898

## RADIAL INJECTOR FOR ASPIRATION OF GASES

Ernst Schürch, Obergrundstr. 3, CH-6000 Luzern, Switzerland

Filed Mar. 31, 1980, Ser. No. 135,618
Claims priority, application Switzerland, Apr. 7, 1979, 3297/79
Int. Cl.³ B01F 3/04
U.S. Cl. 261—93 28 Claims

1. A radial injector for aspirating gases to be mixed with a fluid, comprising a motor housing having a motor therein; rotating means connected to the motor and having a bottom side to be contacted by a fluid and a top side to be contacted by a gas, the rotating means being formed as a rotating disc having the bottom side and a radially outer region and provided at the bottom side in the radially outer region with a plurality of radially extending recesses which form a plurality of radially extending teeth therebetween; and a flange portion projecting



outwardly from the motor housing and being integral therewith and cooperating with the rotating means for providing a ring slot.

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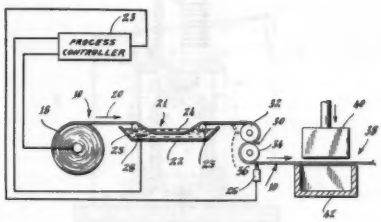
4,313,899

## PROCESS FOR FORMING LAMINATED PAPERBOARD CONTAINERS

Paul Hain, Hamilton, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Filed Feb. 7, 1980, Ser. No. 119,486
Int. Cl.³ B29C 17/03; B31D 5/02; B31F 1/36
U.S. Cl. 264—40.1 26 Claims




1. In a process for continuously deep drawing laminated material into a predetermined three-dimensional shape, said laminate comprising paperboard having a layer of plastic bonded to one side thereof, the improvement comprising the steps of:

heating a liquid to a specified temperature;

applying the heated liquid to said paperboard to impart moisture to said paperboard prior to deep drawing of said laminate;

measuring the amount of moisture in a portion of said paperboard after the heated liquid is applied thereto; and

controlling the amount of moisture imparted to a subsequent portion of said paperboard in response to said measurement, by altering said temperature.

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4,313,900

## METHOD OF FORMING A CERAMIC ARTICLE WITH A GLASSY SURFACE

Frank Gonzales, Jr., Poughkeepsie, and Joseph Sobon, New Paltz, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 26, 1980, Ser. No. 163,034
Int. Cl.³ C04B 33/34, 41/06
U.S. Cl. 264—61 4 Claims

1. A method of forming a defect-free glassy surface layer on a planar surface of a ceramic substrate comprising

forming an intimate ceramic mixture of a particulate ceramic material having particles with an average diameter in the range of 0.2 to 35 microns, a particulate glass material that does not react with the ceramic material when heated to temperatures sufficient to sinter the ceramic material, said

glass material having a softening point in the range of 500° to 1,000° C., said glass material being present in an amount wherein the volume of the glass, when molten, equals or exceeds the void space in the ceramic material, after sintering, forming the ceramic mixture into the desired shape, placing the resultant green ceramic object on a setter tile of a material that is not wettable by the molten glass material, heating the tile and object in an ambient that is non-reactive to the molten glassy material to cause the glass material to become molten and flow downwardly through the ceramic particles to the setter tile, and subsequently sintering of the ceramic material.

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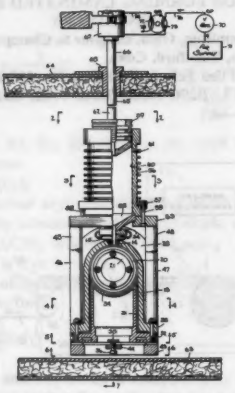
**4,313,901**

## ISOTHERMAL TRANSFER MOLDING

**Edward J. Chu, Parsippany, N.J., assignor to Resistoflex Corporation, Roseland, N.J.**

**Filed Jun. 10, 1976, Ser. No. 694,779**
**Int. Cl.³ B29G *1/10***
**U.S. Cl. 264—127** **2 Claims**



1. The process of producing an article by transfer molding a thermoplastic material selected from the group consisting of fluoroethylene propylene (FEP), perfluoroalkoxy (PFA), polyvinylidene fluoride, and polypropylene resins, wherein said material in a heated condition is transferred by the application of pressure thereto from a charge holding chamber to an interconnected mold, characterised in that heat is applied to said chamber and said mold so as to maintain both at the same substantially constant temperature above the melting point of said material while said material in a melt state is transferred from said chamber to said mold under a transfer pressure on the material within the range of 190 to 230 psi (13.359 to 16.171 $Kg/cm^2$).

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**4,313,902**

## PRESTRESSED CONCRETE PRESSURE VESSELS

**Tung-Yen Lin, El Cerrito; Yue-Chyou Yang, San Francisco, and Philip Y. Chow, Orinda, all of Calif., assignors to T. Y. Lin International, San Francisco, Calif.**

**Division of Ser. No. 4,742, Jan. 19, 1979, Pat. No. 4,265,066, which is a continuation-in-part of Ser. No. 789,634, Apr. 21, 1977, abandoned. This application Aug. 11, 1980, Ser. No. 177,180**
**Int. Cl.³ B28B *23/08***
**U.S. Cl. 264—228** **4 Claims**

1. A method of forming a prestressed concrete pressure vessel having a generally cylindrical exterior wall, comprising:

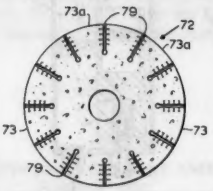
establishing preliminary form work,

placing a rigid liner for each internal pressure-containing cavity which is to be included in the vessel,

installing appropriate connecting lines between internal cavities and to the exterior of the vessel space,

installing tendon ducts for prestressing tendons, including series of generally annular horizontal tendon ducts placed to be spaced inwardly from the exterior wall of the vessel, said ducts being spaced apart vertically and included at various levels throughout the height of the vessel, and including a series of vertical tendon ducts positioned around each internal cavity liner and spaced apart from one another, and including supporting the tendon ducts appropriately for pouring,

positioning a series of crack-inducing separator forms in




angularly-spaced relationship around the vessel, with each form positioned to extend generally from the exterior surface of the vessel radially inwardly part way into the vessel wall, spaced from the internal cavities, extending substantially through the height of the vessel wall,

emplacing forms for the exterior wall of the vessel, including forms for tendon anchors at appropriate locations,

pouring the concrete,

placing tendons through tendon ducts, with anchor means connected to the tendon ends at the anchors on the exterior wall, and

post-tensioning the tendons, via the anchor means, after the concrete has set up.

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**4,313,903**

## PROCESS FOR INJECTION MOLDING OF POLYETHYLENE TEREPHTHALATE COMPOSITIONS AT REDUCED MOLD TEMPERATURE

**Peter Bier, New Martinsville, W. Va., assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Nov. 19, 1979, Ser. No. 95,275**
**Int. Cl.³ B29F *1/00*; B28B *1/24***
**U.S. Cl. 264—328.1** **1 Claim**

1. A process for injection molding a thermoplastic composition comprising:

(a) intimately blending (i) from 80 to 97% by weight of a polyethylene terephthalate having an intrinsic viscosity of at least 0.3 dl/g measured as a 0.5% by solution in in a 1:1 mixture of phenol and tetrachloroethane at 25° C.; and (ii) from 3 to 20% by weight of an organic compound containing at least one imide group and having a melting point greater than 240° C., and

(b) injecting molding said blend into a mold held at a temperature of no more than 110° C. and of no less than 80° C.

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**4,313,904**

## METHOD OF MANUFACTURING A FLEXIBLE CONTAINER WITH INTEGRAL PORTS AND DIAPHRAGM

**Mark E. Larkin, Lindenhurst, and Leonard J. Meyer, Antioch, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.**

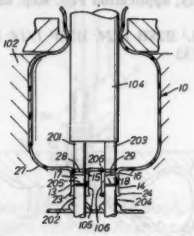
**Filed Dec. 26, 1979, Ser. No. 106,954**
**Int. Cl.³ B29C *17/07*; B29D *3/00*; B65B *3/02***
**U.S. Cl. 264—515** **4 Claims**

1. An improved method of manufacturing a flexible plastic container for sterile solutions having a plurality of tubular

ports integrally formed and extending thereform, comprising the steps of:

extruding a parison of heated plastic material into a mold having portions shaped as a hollow cavity and as tubular ports, and blowing said parison into the shape of said mold, the improvement comprising the steps of:

inserting a plurality of pairs of diaphragm pins against lower portions of said container within portions of the mold shaped as tubular ports; each of said pins being coaxially



aligned to a corresponding pin, one inside and one outside of said container;

squeezing said portions of said container between said pairs of pins so as to form said tubular port and diaphragms across the openings to said portions of said mold shaped as tubular ports;

coolig said plastic material sufficiently to retain the shape of said mold of said diaphragm and of each of said ports;

removing said diaphragm pins; and

removing said container from said mold.

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**4,313,905**

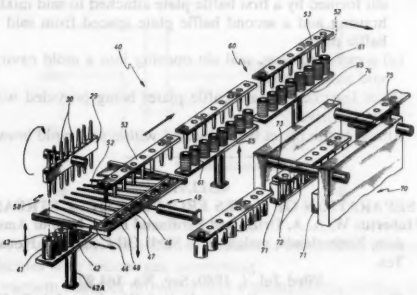
## BLOW MOLDING METHOD

**Robert X. Hafele, 5836 Vicksburg Dr., Baton Rouge, La. 70816**

**Filed Nov. 26, 1979, Ser. No. 97,229**

**Int. Cl.³ B29C *17/07***

**U.S. Cl. 264—532** **13 Claims**



1. In a method of forming a plurality of thermoplastic articles, the steps of:

(a) injection molding a plurality of essentially tubular, thermoplastic preforms at a first position interiorly of a plurality of mold cavities around a plurality of substantially cylindrical core pins mounted on a rotatable turret, thereby forming preforms having at least one open end;

(b) indexing the turret to displace the core pins from the first position to a second position;

(c) retaining the preforms on the core pins during the indexing step to cool the preforms;

(d) maintaining the inner surfaces of the preforms in contact with the core pins while engaging the outer surface of the preforms with a set of molds having inner dimensions substantially equivalent to the outer dimensions of the preforms, and thereby cooling the preforms to an essentially self-sustaining condition by transferring heat from both the inner and outer surfaces of the preforms respectively to the associated core pins and the set of the molds;

(e) removing the preforms from the core pins;

(f) positioning the preforms in carrier blocks substantially aligned with the core pins and displacing the carrier blocks to space the preforms further apart preparatory to blow molding;

(g) telescopically inserting a plurality of respective carrier sleeves into the preforms as spaced apart by the performance of step (f);

(h) thermally conditioning the preforms while on the carrier sleeves to a temperature conducive to blow molding; and

(i) blow molding the preforms within a plurality of blow mold cavities.

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**4,313,906**

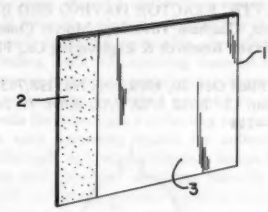
## TWO DIMENSIONAL TWO PHASE THIN LAYER CHROMATOGRAPHY PLATE AND METHOD

**Thomas J. Filipi, Parsippany, and Michael E. Mazzei, Butler, both of N.J., assignors to Whatman, Inc., Clifton, N.J.**

**Filed Aug. 17, 1979, Ser. No. 67,424**

**Int. Cl.³ G01N *31/08***

**U.S. Cl. 422—69** **2 Claims**



1. A thin layer chromatography plate for two-dimensional chromatography of a sample, said plate comprising a first surface portion consisting essentially of silica gel having octadecyl groups attached thereto, said first composition being suitable to perform reverse phase thin layer partition chromatography in a first direction on said plate, and a second surface portion including a second composition, different from said first composition, comprising silica gel, said second composition being suitable to perform adsorptive chromatography in a second direction on said plate.

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**4,313,907**

## APPARATUS FOR THE DETECTION OF A COMBUSTIBLE GAS

**Frank X. McNally, Venetia, Pa., assignor to National Mine Corporation, Pittsburgh, Pa.**

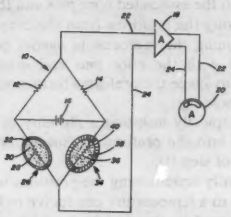
**Filed Apr. 21, 1980, Ser. No. 142,025**

**Int. Cl.³ G01N *27/16***

**U.S. Cl. 422—97** **6 Claims**

1. In an apparatus for detecting a combustible gas which comprises a Wheatstone bridge circuit having (a) a detector element comprising an electrically conducting member coated with a refractory and having on the surface of said refractory a catalyst for the oxidation of said gas, said detector element constituting one leg of said bridge, and (b) a reference element comprising an electrically conducting member coated with a refractory, said reference element constituting a second leg of said bridge, whereby upon catalytic oxidation of said gas an electrical signal approximately proportional to the amount of

said gas present at the detector element is produced, the Improvement which comprises,



a detector element having as said catalyst a composition containing palladium, palladium oxide and nickel oxide.

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**4,313,908**

## CATALYTIC REACTOR HAVING BED BYPASS

**Ramesh Gupta, Chatham Township, Morris County, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Oct. 20, 1980, Ser. No. 198,793**
**Int. Cl.³ B01J** *3/02, 4/00, 8/04, 19/24*
**U.S. Cl. 422—111** **13 Claims**

1. A reactor for reacting a two phase, gas and liquid mixture in a fixed bed of solids, comprising:

a vessel;

means to introduce both liquid and gas into said vessel;

means to remove both liquid and gas from said vessel;

at least one main bed disposed in said vessel;

and

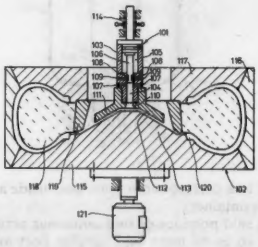
at least one auxiliary bed disposed above said main bed having separate liquid and gas bypasses, said liquid and gas bypasses comprising relatively different lengths of hollow, invariably open tubing extending through said auxiliary bed, said gas bypass tubing projecting to a greater height above said auxiliary bed than said liquid bypass tubing in order to provide a low pressure drop bypass for both said liquid and gas to said main bed, when said auxiliary bed becomes fouled.

**4,313,909**

## METHOD AND AN APPARATUS FOR PRODUCING A REACTION MIXTURE FOR FORMING SOLID OR CELLULAR SUBSTANCES FROM FLOWABLE REACTANTS AND OPTIONALLY FILLERS

**Heinrich Boden; Heinz Müller, both of Leverkusen, and Bernd Sowade, Berg.-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Mar. 14, 1980, Ser. No. 130,293**
**Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911547**
**Int. Cl.³ B28B** *1/24;* **B29F** *1/14;* **B29H** *7/20*
**U.S. Cl. 422—133** **7 Claims**



1. An apparatus for producing a reaction mixture for forming solid or cellular materials from flowable reactants, and optionally, fillers, comprising:

(a) storage containers for the reactants,

(b) a mixhead housing,

(c) feed pipes leading from each of said storage containers via metering pumps to the inlet openings of a mixing chamber located in said mixhead housing, said mixing chamber having at least one outlet opening,

(d) an after mixing chamber,

(e) said outlet opening leading to the inlet opening of said aftermixing chamber,

(f) said aftermixing chamber being in the form of a slit, said slit formed by a first baffle plate attached to said mixhead housing and a second baffle plate spaced from said first baffle plate,

(g) a mold housing, said slit opening into a mold cavity of said mold housing,

(h) at least one of said baffle plates being provided with a rotary drive,

(i) said baffle plates being located within said mold housing.

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**4,313,910**

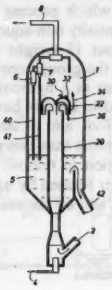
## SEPARATION OF GASES FROM PARTICLE STREAMS

**Hubertus W. A. A. Dries, and Ferdinand Dane, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.**

**Filed Jul. 1, 1980, Ser. No. 164,974**
**Claims priority, application United Kingdom, Jul. 2, 1979, 22994/79**
**Int. Cl.³ B01J** *8/24;* **F27B** *15/02;* **B07B** *7/04*
**U.S. Cl. 422—147** **6 Claims**

1. A catalytic cracking reactor comprising an upright enclosed vessel defining a lower zone for fluidized catalyst and an upper zone for separation of catalyst particles from hydrocarbon vapors, an upright riser conduit extending into said lower portion of said reactor forming an upwardly directed cracking path and communicating at the upper outlet with the interior of said reactor, a curved hood disposed substantially horizontally above said riser conduit and communicating with the interior of said riser conduit and the interior of said reactor for changing the direction of flow of catalyst particles in an upflowing carrier gaseous stream within said riser conduit from more than 90° up to about 180° with respect to said

upflowing carrier gaseous stream, at least one conduit disposed on said curved hood, said at least one conduit communicating



with the lower surface of said curved hood, and adapted for connection to a source of substitute fluid, for displacing carrier gas from said particulate stream.

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**4,313,911**

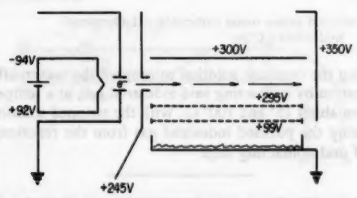
## LOW PRESSURE TRITIATION OF MOLECULES

**Thomas F. Moran; James C. Powers, and Mark O. Lively, III, all of Atlanta, Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.**

**Division of Ser. No. 24,192, Mar. 27, 1979, Pat. No. 4,242,186. This application Nov. 13, 1979, Ser. No. 93,304**

**Int. Cl.³ G21 *00/00***

**U.S. Cl. 422—159** **7 Claims**




1. An apparatus for tritiating molecules by reaction of said molecules with tritium gas, comprising:

a vacuum chamber provided with a means for supporting an electron beam generator;

means for evacuating said chamber to a reduced pressure less than 0.1 torr;

means to accelerate electrons attached to said electron beam generator for accelerating and directing said electron beam to an electron target of said accelerator; and repeller plate and target plate means spaced apart between said electron beam generator and said electron target and positioned such that the surfaces of said plates and the electron beam which traverses said accelerator are parallel, the difference in potential between said plates being such that the tritium gas molecule ions produced by electron beam impact on tritium gas molecules are accelerated in a direction normal to said beam toward said target plate.

**4,313,912**

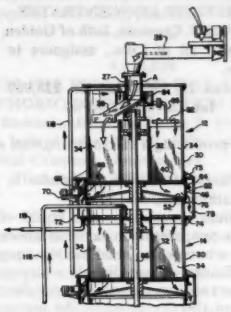
## APPARATUS FOR THE CONTINUOUS EXTRACTION OF OILS AND SOLUBLE SUBSTANCES FROM SOLID MATERIALS

**William M. Barger, Piqua, Ohio, assignor to The French Oil Mill Machinery Company, Piqua, Ohio**

**Filed Oct. 8, 1980, Ser. No. 195,577**

**Int. Cl.³ B01D *11/02***

**U.S. Cl. 422—267** **7 Claims**



1. In a continuous solvent extracting apparatus, having a cylindrical housing, material distribution means in an upper portion of said housing, a plurality of vertically stacked extractor sections each including a plurality of vertically disposed radially extending walls for receiving material therebetween from said material distribution means, screening means beneath said walls for retaining processed material in a section and passing miscella therethrough, a collecting pan associated with and beneath each screening means for collecting miscella passed therethrough, miscella distribution means for removing miscella from said pans and supplying miscella to an upper portion of each section and material removal means for removing material from a lowermost extractor section, wherein the improvement comprises:

said plurality of walls are stationary and abut said housing with each adjacent pair of walls and said housing forming a basket with said baskets in each section being in registry with said baskets in all other sections;

each said screening means being horizontally disposed, disc-shaped, mounted for rotation and having an opening defined therein generally co-extensive with a basket when in registry therewith;

each said pan having an opening defined therein in alignment with said opening defined in said associated screening means for passing material from a basket of one section to a basket of a subsequent section and mounted for rotation with said associated screening means; and

means for rotating each said associated screening means and said pan simultaneously.

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**4,313,913**

## PRODUCTION OF HYDROLYZABLE TITANYL SULPHATE SOLUTION

**Peter Panek; Walter Gutsche, and Peter Woditsch, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Dec. 5, 1980, Ser. No. 213,539**

**Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951799**

**Int. Cl.³ C01G *23/00***

**U.S. Cl. 423—82** **9 Claims**

1. A process for the production of a hydrolyzable titanyl sulphate solution comprising contacting sulphuric acid of about 86% concentration with a mixture of slag and ilmenite, the ratio of $H_2SO_4$ to $TiO_2$ in the mixture ranging from about

1.7:1 to 2.2:1 and the mol ratio of Ti(III) to Fe(III) in the mixture ranging from about 25:1 to 1.4:1, the slag having a $TiO_2$ content of 80% and a Ti(III) content of about 22 to 40% calculated as $TiO_2$ and the ilmenite having a Fe(III) to Fe(II) ratio from about 1:1 to 10:1, and adding water if necessary to bring the concentration of sulphuric acid to from about 86 to 96%.

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## 4,313,914
## AUTOCLAVE TUNGSTATE UPGRADING OF SCHEELITE CONCENTRATES

**Dale K. Huggins; Paul B. Queneau, both of Golden, and Leo W. Beckstead, Arvada, all of Colo., assignors to Amax Inc., Greenwich, Conn.**

**Filed Jan. 19, 1981, Ser. No. 225,909**
**Int. Cl.³ C01G *41/00***
**U.S. Cl. 423—58** **19 Claims**

1. A process for producing a calcium tungstate concentrate, comprising

(a) forming a slurry of calcium carbonate in an aqueous sodium tungstate liquor,

(b) reacting sodium tungstate in the liquor with calcium carbonate at a temperature of at least about 130° C. to form sodium carbonate and solid calcium tungstate, while providing sufficient carbon dioxide overpressure to the slurry to convert sodium carbonate in the slurry to sodium bicarbonate and thereby promote the conversion of sodium tungstate to calcium tungstate, thereby forming a product slurry containing a sodium bicarbonate liquor and a solid calcium tungstate concentrate which can be recovered from said product slurry and,

(c) stripping carbon dioxide from the sodium bicarbonate liquor to convert sodium bicarbonate to sodium carbonate in solution and evolved carbon dioxide.

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## 4,313,915
## METHOD FOR THE MANUFACTURE OF PHOSPHORIC ACID BY THE WET PROCESS

**Michel Dabeaux, Paris, and Nikita Tyrtoff, La Celle St Cloud, both of France, assignors to Produits Chimiques de la Montagne Noire, Paris, France**

**Continuation of Ser. No. 853,423, Nov. 21, 1977, abandoned. This application May 17, 1979, Ser. No. 40,149**
**Claims priority, application France, Nov. 30, 1976, 76 36114**
**Int. Cl.³ C01B *25/225***
**U.S. Cl. 423—167** **3 Claims**

1. A method for the preparation of phosphoric acids by the wet process by reacting at least one natural phosphate with sulphuric acid and subsequently obtaining a calcium sulfate dihydrate which is separated, wherein said reaction is effected in the presence of 50 to 500 g/t of phosphate consumed, of at least one non-ionic surface active agent, obtained by condensation of 2 to 30 molecules of ethylene oxide per molecule of at least one branched fatty alcohol of which the aliphatic chain comprises 6 to 22 carbon atoms.

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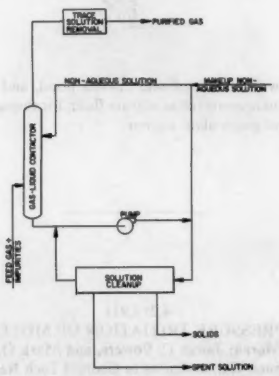
## 4,313,916
## PROCESS FOR THE PURIFICATION OF NON-REACTING GASES

**Robert A. Jones, Jr., South Charleston; Arthur E. Marcinkowsky, Charleston, and George E. Keller, II, South Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 89,316, Oct. 31, 1979, abandoned, which is a continuation-in-part of Ser. No. 38,736, May 14, 1979, abandoned. This application Apr. 17, 1980, Ser. No. 141,141**
**Int. Cl.³ G01D *53/34***
**U.S. Cl. 423—226** **12 Claims**

1. The process for the purification of an industrial gas stream of one or more of hydrogen, carbon monoxide, air, nitrogen, oxygen, helium, argon, mono-olefins having from two to five carbon atoms per molecule, diolefins having four or five carbon atoms per molecule, paraffins and acetylenes, by the removal of trace amounts of impurities therein, of one or more of water, hydrogen sulfide, carbon dioxide, carbonyl sulfide, sulfur dioxide, hydrogen chloride, hydrogen cyanide, nitric acid, and mercaptans which process comprises the steps of: providing a liquid essentially non-aqueous solution comprising from about 0.5 to about 15 weight percent of at least one member selected from the group consisting of alkali and alkaline earth metal, present as a hydroxide or a carbonate, in a liquid aliphatic polyhydric alcohol having a carbon to oxygen ratio of one to about five, and at least two oxygens thereof being separated by not more than two sequential carbon atoms; heat treating said solution to remove water originally in the solution as well as water formed by natural hygroscopic reaction with said alcohols and by the reaction:




selected group metal hydroxide + polyhydric alcohol $\rightleftharpoons H_2O$ + metal alcoholate,

as well as the following reaction to activate said solution (if a carbonate is selected):

selected group metal carbonate + $H_2O_2 \rightleftharpoons$ metal hydroxide + $CO_2$;

stripping the resultant solution to remove the water, effecting purification by contacting said industrial gas, at a temperature between about 15° and 100° C., with the stripped solution; and separating the purified industrial gas from the reaction products of said contacting step.

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## 4,313,917
## METHOD OF DEFOAMING AMINE SOLUTIONS

**Kazuro Ohta, Yokohama, Japan, assignor to Nippon Petroluem Refining Company Limited, Tokyo, Japan**

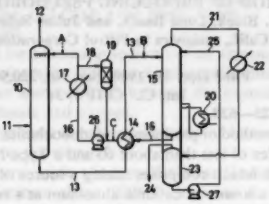
**Filed Jun. 10, 1980, Ser. No. 158,231**
**Int. Cl.³ B01D *53/34***
**U.S. Cl. 423—228** **7 Claims**

1. In the process of continuously contacting acidic gases containing principally hydrogen sulfide or carbon dioxide with an aqueous amine solution, resulting in the development of foams or bubbles in the system, the improvement which comprises adding to the system a foam inhibitor having the general silicone formula:

$$R_1-\underset{\displaystyle R_3}{\overset{\displaystyle R_2}{\underset{|}{\overset{|}{Si}}}}-O-\left(\underset{\displaystyle R_5}{\overset{\displaystyle R_4}{\underset{|}{\overset{|}{Si}}}}-O\right)_n-\underset{\displaystyle R_7}{\overset{\displaystyle R_6}{\underset{|}{\overset{|}{Si}}}}-R_8$$

where $R_1$–$R_8$ are organic residues of 1–10 carbons, and n is an integer, and characterized by part of $R_1$–$R_8$ being substituted by a group of the general formula:

—$R_9$—OH



where $R_9$ is a hydrocarbon or organic residue of 1–10 carbons; or characterized by part of $R_1$–$R_8$ being substituted by a group of the general formula:

—$NR_{10}R_{11}$

where $R_{10}$ and $R_{11}$ are either hydrogen or hydrocarbon or organic residue of 1–10 carbons.

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## 4,313,918

## PROCESS AND DEVICE FOR THE PREPARATION OF A PRODUCT CONTAINING AMMONIUM ORTHOPHOSPHATE, AND PRODUCT OBTAINED BY THIS PROCESS

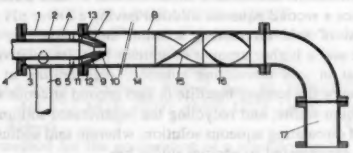
**Petrus F. A. M. Hendriks, Geleen; Arie Jansen, Ridderkerk; Willem B. van den Berg, Prinsenbeek, and Cornelis Hoek, Nieuwstadt, all of Netherlands, assignors to Unie Van Kunstmestfabrieken, B.V., Utrecht, Netherlands**

**Filed May 29, 1979, Ser. No. 43,423**

**Claims priority, application Netherlands, Jun. 1, 1978, 7805957**

**Int. Cl.³ C01B *25/28***

**U.S. Cl. 423—310** **8 Claims**



1. In a process for preparing an ammonium orthophosphate product substantially free of ammonium polyphosphate from ammonia and phosphoric acid, including reacting the phosphoric acid and gaseous ammonia together by spraying through a two-phase spraying means having two coaxial ducts, contacting and thoroughly mixing the ammonia and phosphoric acid flows discharged from said ducts in a cylindrical reaction zone adjacent and surrounding said spraying means and coaxial therewith and phosphoric acid being sprayed through the inner duct,

the improvement comprising:

spraying said phosphoric acid at an axial outflow rate of from 1 to 10 m/sec., in conjunction with

spraying said ammonia at an axial outflow rate of from 200 to 1,000 m/sec. (N.T.P.),

combining the two flows in said cylindrical reaction zone, by causing the outgoing ammonia flow to intersect at an acute angle the central phosphoric acid flow on all sides in the reaction zone at the discharge of the phosphoric acid flow, said

reaction zone having a diameter D of from about 2 to about 4 times the outer diameter of the ammonia flow discharged from said spray means, and said reaction zone having a length of about 10 to about 25 times said diameter D,

passing the mixture in said reaction zone over and in contact with at least two oppositely twisted successive baffle plates, the baffle plates having a dimension normal to the direction of flow equal to the diameter of the reaction zone, and

discharging and collecting the thus-prepared ammonia orthophosphate containing product.

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## 4,313,919

## PROCESS FOR REMOVING FINE SOLIDS FROM PHOSPHORIC ACID BY VACUUM FILTRATION

**Thomas E. Richards, Jennings; James P. Harvey, and Michael A. Daigle, both of Lake City, all of Fla., assignors to Occidental Chemical Company, Houston, Tex.**

**Filed Jul. 15, 1980, Ser. No. 169,078**

**Int. Cl.³ C01B *25/16***

**U.S. Cl. 423—321 R** **10 Claims**

1. A process for removing solid impurities contained in aqueous phosphoric acid comprising:

(a) passing said aqueous phosphoric acid containing solid impurities at an elevated temperature through a filter cake of a phosphoric acid-resistant filter aid supported on a porous medium, thereby to cause at least a portion of said solid impurities in said aqueous phosphoric acid to be removed therefrom and to be retained by said filter cake and wherein a portion of said aqueous phosphoric acid is retained in said filter cake;

(b) contacting at least a portion of said filter cake with finely divided droplets of a liquid, in an amount sufficient to cause at least a portion of said aqueous phosphoric acid which is retained in said filter cake to pass through to produce a filtrate comprising filtered, aqueous phosphoric acid, said liquid being maintained at a temperature such as to minimize fracturing of said filter cake;

(c) collecting said filtrate; and

(d) removing an impurity-containing first portion of said filter cake after contact with said aqueous phosphoric acid containing solid impurities and said liquid, and leaving a second portion of said filter cake containing a lesser amount of impurities than said first portion for subsequent use in the removal of solid impurities from phosphoric acid containing solid impurities.

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## 4,313,920

## CARBON BLACK AGGLOMERATE PRODUCTION

**William T. Cooper, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.**

**Filed Feb. 26, 1980, Ser. No. 124,890**

**Int. Cl.³ C01B *31/02*; C09C *1/48***

**U.S. Cl. 423—449** **4 Claims**

1. A process for producing carbon black comprising

(a) generating a stream of hot smoke comprising essentially non-agglomerated carbon black particles suspended in a combustion gas by subjecting a carbon containing feed stock to carbon black formation conditions,

(b) precooling said hot smoke to a temperature in the range of about 1500° to 2100° F.,

(c) introducing the precooled smoke into a sonic agglomerator wherein said precooled smoke is subjected to sound waves, thereby agglomerating said non-agglomerated carbon black particles to form a two-phase system of a continuous gas phase containing a solid phase of carbon black agglomerates,

(d) letting said two-phase system at least partially separate into a carbon black agglomerate mass and a gas mass of reduced carbon black content,

(e) passing said gas mass of reduced carbon black content from said sonic agglomerator into a cyclone separator

causing the separation of further carbon black agglomerates from said gas mass,

(f) withdrawing a gas stream with low carbon black content from said cyclone separator,

(g) passing said gas stream with low carbon black content through an indirect heat exchanger for cooling said gas stream and heating a fluid,

(h) passing said gas stream with low carbon black content from the heat exchanger through a filter unit,

(i) collecting the carbon black separated from the precooled smoke in the sonic agglomerator, from the gas mass in the cyclone and from the cooled gas stream with low carbon black content in the filter as a carbon black product of the process.

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**4,313,921**

**CARBON BLACK PROCESS**

**Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.**

**Division of Ser. No. 895,430, Apr. 12, 1978, Pat. No. 4,224,284, which is a continuation-in-part of Ser. No. 498,776, Aug. 19, 1974, abandoned. This application Mar. 31, 1980, Ser. No. 135,607**

**Int. Cl.³ C01B *31/02*; C09C *1/48***

**U.S. Cl. 423—456** **9 Claims**

1. In a process for the production of carbon black by the pyrolytical decomposition of hydrocarbons comprising the steps of:

a. introducing hydrocarbons along the axis of a tubularly shaped longitudinal reactor having an upstream confining wall arranged essentially orthogonally to the longitudinal axis of the reactor,

b. introducing combustion gases tangentially into said reactor at a location close to said upstream confining wall to form a vortex of hot combustion gases spinning around the hydrocarbon,

c. withdrawing carbon black containing smoke from the downward end of said reactor,

the improvement comprising

d. introducing a gas parallel to said upstream confining wall and essentially in radially outward direction into said reactor in a boundary zone extending about one-half to one inch axially from said upstream confining wall, such as to counteract a radially inwardly directed boundary layer flow caused by the tangentially introduced hot combustion gases close to said upstream confining wall and to thereby reduce the pressure drop through the carbon black reactor that exists without said gas being radially outwardly introduced.

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**4,313,922**

**REDUCING ASH CONTENT OF MOLTEN SULFUR**

**Thomas H. Ledford, Baton Rouge, La., and Raul E. Perez, Madison, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Aug. 1, 1980, Ser. No. 174,432**

**Int. Cl.³ C01B *17/02***

**U.S. Cl. 423—578 R** **12 Claims**

1. A method for reducing the concentration of ash-forming compounds in molten sulfur comprising the steps of:

(a) adding an effective amount of an ash-flotation agent selected from the class consisting of:

(i) dithionates, dithionites, bisulfides, bisulfites, and sulfites;

(ii) phosphines, phosphine oxides, phosphine sulfides, and hypophosphates;

(iii) ammonium compounds, mono, di- tri- and tetraureas, thiourea, and cyclic urea;

to the molten sulfur to thereby cause at least a portion of the ash-forming compounds having a specific gravity less than that of the molten sulfur to float to and collect at the surface of the molten sulfur; and

(b) removing at least a portion of the ash-forming compounds that collect at the surface of the molten sulfur.

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**4,313,923**

**METHOD OF PRODUCING PSEUDOBOEHMITES**

**Thomas E. Block, Long Beach, and Julius Scherzer, Anaheim, both of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.**

**Filed Dec. 29, 1980, Ser. No. 220,904**

**Int. Cl.³ C01F *7/34***

**U.S. Cl. 423—628** **6 Claims**

1. The method of producing pseudoboehmite having a Peptization Index of less than about 60 and a Type No. of less than about 0.32, which comprises mixing a source of anionic aluminum with a source of cationic aluminum at a ratio to produce a pH in the range of about 9 to about 10.5 and at a temperature in the range of about 65° C. to about 80° C. to produce a mother liquor slurry containing alumina hydrate of more than about 2% to about 7% by weight of the reactant solution (calculated as the equivalent anhydrous alumina), aging the mother liquor at a temperature in the range of about 60° C. to about 80° C. for a time ranging from about twenty (20) hours at 80° C. to about sixty (60) hours at 60° C., separating the alumina hydrate from the mother liquor.

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**4,313,924**

**PROCESS FOR REMOVAL OF SULFUR DIOXIDE FROM GAS STREAMS**

**Daniel E. Pike, Harrington Park, N.J., assignor to Neptune AirPol, Inc., Englewood, N.J.**

**Filed May 10, 1979, Ser. No. 37,844**

**Int. Cl.³ C01B *17/00***

**U.S. Cl. 423—242** **8 Claims**

1. A process for the removal of sulfur dioxide from a gas stream containing said sulfur dioxide comprising establishing a circulating aqueous absorption solution of sodium sulfite and sodium bisulfite; contacting said gas stream with said circulating solution to absorb said sulfur dioxide in said solution and produce a second aqueous solution having a lower pH relative to that of said circulating solution and containing sodium sulfite and a higher amount of sodium bisulfite relative to the amount in said circulating solution; regenerating at least a portion of the sodium bisulfite in said second aqueous solution to sodium sulfite; and recycling the regenerated sodium sulfite to said circulating aqueous solution; wherein said sodium bisulfite is regenerated to sodium sulfite by:

(1) reacting a portion of said second aqueous solution with a slurry of coarse lime particles at a pH of less than 8 to produce a second slurry of calcium sulfite and calcium sulfate containing dissolved sodium sulfite and sodium bisulfite, and thickening said second slurry by separating and removing an overhead solution therefrom containing such dissolved sodium bisulfite to thereby produce a thickened slurry underflow;

(2) reacting only the thickened slurry underflow with an aqueous lime solution containing suspended fine lime particles at a high pH to regenerate sodium hydroxide from sodium bisulfite and form a third slurry having a higher content of calcium sulfate than said second slurry;

(3) filtering the resulting third slurry before substantial amounts of calcium sulfate are dissolved in solution to produce a substantially solid filter cake and a liquid filtrate containing soldum sulfite and sodium hydroxide; and

(4) recycling said liquid filtrate and said solution separated from the thickened slurry to said circulating aqueous absorption solution.

4,313,925

## THERMOCHEMICAL CYCLIC SYSTEM FOR DECOMPOSING $H_2O$ AND/OR $CO_2$ BY MEANS OF CERIUM-TITANIUM-SODIUM-OXYGEN COMPOUNDS

Carlos E. Bamberger, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 24, 1980, Ser. No. 143,253
Int. Cl.[3] C01B *3/04;* C01G *23/00*
U.S. Cl. 423—263 8 Claims

1. A method for producing sodium cerous titanate comprising reacting ceric oxide, titanium dioxide and sodium titanate at a temperature above 900° C. to cause the formation of sodium cerous titanate and oxygen.

4. A cyclic process for the production of hydrogen from water comprising the steps of:

(a) reacting ceric oxide, titanium dioxide and sodium titanate at a temperature above 900° C. to cause formation of sodium cerous titanate and oxygen;

(b) reacting thus-produced sodium cerous titanate with steam and one of sodium carbonate and sodium bicarbonate at a temperature above 500° C. to produce ceric oxide, sodium titanate, carbon dioxide and hydrogen, which is removed from the reaction environment;

(c) reacting sodium titanate produced in step (b) with water and carbon dioxide to produce titanium dioxide and sodium bicarbonate and removing the thus-produced sodium bicarbonate; and

(d) recycling ceric oxide produced in step (b), titanium dioxide produced in step (c) and sodium titanate remaining from step (c) to step (a).

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4,313,926

## METHOD FOR THE PREPARATION OF A SCINTILLOGRAPHIC AGENT

Krystyna Samochocka, Warsaw, Poland, assignor to Uniwersytet Warszawski, Warsaw, Poland

Filed Apr. 9, 1979, Ser. No. 28,299
Claims priority, application Poland, Apr. 10, 1978, 205961
Int. Cl.[3] A61K *49/00, 43/00;* C07F *13/00*
U.S. Cl. 424—1 4 Claims

1. A method for the preparation of a scintillographic agent which comprises dissolving 2,4-dimethylaniline in acetic acid at room temperature, mixing the resulting solution with chloracetyl chloride, crystallizing the sediment from ethanol and regaining a further quantity of acetanilide from postcrystallization bases, dissolving the resulting ω-chlor-2,4-dimethylactanilide derivative together with the sodium salt of iminodiacetic acid in aqueous ethanol, the proportion by volume of water to ethanol being 1:1.2, heating the solution for several hours, evaporating the solvent, dissolving the dry residue, separating the non-reacted component and adjusting the pH of the remaining solution to a value of about 2.5 with hydrochloric acid, dissolving the precipitated sediment, evaporating the solvent and crystallizing the said derivative from water or from a 25% aqueous solution of sodium acetate, dissolving the derivative once more in an aqueous solution of sodium hydroxide or in water, again adjusting the pH to a value of 4 to 6, passing the solution through a sterile filter, freeze-drying and keeping it in sterile ampoules, and finally, prior to administration, chelating the obtained derivative of iminodiacetic acid with a radiometal.

4,313,927

## IMMUNOASSAY METHOD FOR DETECTING VIRAL ANTIBODIES IN WHOLE BLOOD SAMPLES

Bertold R. Fridlender, Jerusalem, Israel, assignor to Ames-Yissum Ltd., Jerusalem, Israel

Filed Oct. 19, 1979, Ser. No. 86,399
Int. Cl.[3] G01N *33/56, 33/58*
U.S. Cl. 424—1 11 Claims

1. In an immunoassay method for the detection of an antibody ($Ab_1$) to a viral antigen (Ag) in human blood wherein

(a) a test sample is incubated with a solid-phase form of Ag whereby any $Ab_1$ present in the test sample becomes bound to said solid phase Ag,

(b) the resulting solid-phase Ag-$Ab_1$ complexes are separated from the test sample,

(c) a label-incorporated form of an antibody to $Ab_1$ ($Ab_2$*) is contacted with the separated, solid-phase Ag-$Ab_1$ complexes;

(d) the resulting solid-phase Ag-$Ab_1$-$Ab_2$* complexes are separated from excess $Ab_2$*, and

(e) the amount of said label in the separated, solid-phase Ag-$Ab_1$-$Ab_2$* complexes is measured as a function of the presence of $Ab_1$ in said test sample,

the improvement which comprises employing as said test sample a whole human blood sample diluted at least 1:20 by volume with an isotonic aqueous solution, such dilution being less than that at which analytically significant concentrations of said antibody ($Ab_1$) in the undiluted test sample cannot be detected reproducibly.

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4,313,928

## COMPOSITION FOR LABELING OF RED BLOOD CELLS WITH RADIOACTIVE TECHNETIUM

Makoto Kato, Kobe, and Masaaki Hazue, Amagasaki, both of Japan, assignors to Nihon Medi-Physics Co., Ltd., Hyogo, Japan

Filed Nov. 19, 1979, Ser. No. 95,789
Claims priority, application Japan, Nov. 20, 1978, 53-143956
Int. Cl.[3] A61K *43/00, 49/00*
U.S. Cl. 424—1.5 4 Claims

1. A method for the intracorporeal labeling of red blood cells in a living body with radioactive technetium, which comprises:

administering into a blood vessel of the living body an aqueous solution of a non-radioactive composition comprising as the essential components (a) at least one of pyridoxal and its salts, (b) at least one stannous salt and (c) at least one α-amino acid and

subsequently administering into a blood vessel of the living body an aqueous solution of radioactive technetium, whereby the red blood cells are specifically labeled with radioactive technetium.

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4,313,929

## METHOD OF MEASUREMENT OF ANTIGENS AND ANTIBODIES

Shiro Morita, Tokyo; Masanobu Sawai, Yamato; Shin-ichro Matsumoto, Tokyo, and Tadamitsu Sudo, Sagamihara, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jan. 16, 1979, Ser. No. 3,797
Claims priority, application Japan, Feb. 16, 1978, 53/16757
Int. Cl.[3] G01N *33/54*
U.S. Cl. 424—12 21 Claims

1. A method for determining antigens and antibodies which comprises reacting an antigen or antibody or a mixture thereof with a corresponding antibody, antigen or mixtures thereof which has been supported on insoluble carrier particles having an average diameter of not greater than 1.6 microns, said reaction being carried out in a liquid medium, irradiating the resulting reaction mixture with light of a wavelength in the range of 0.8 to 2.4 microns at one or more points of time after

the reaction has been started, and measuring the intensity of total light scattered by the reaction mixture in the directions other than that of the incident beam.

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4,313,930

## STABLE VALEPOTRIATE COMPOUNDS AND PROCESS FOR THEIR PREPARATION

Martin Wischniewski; Lutz Feicho, both of Neustadt, and Werner Althaus, Burgdorf, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

Filed Oct. 31, 1979, Ser. No. 89,718

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2849029

Int. Cl.³ A61K *9/32, 9/34, 9/36, 31/35*

U.S. Cl. 424—32 10 Claims

1. A process for the preparation of a stable valepotriate composition comprising removing non-specific impurities from a pharmaceutically active valerianacea extract to produce a purified valepotriate fraction, mixing said purified valepotriate fraction with an aqueous solution containing at least one pharmaceutically acceptable sheathing compound, and forming microspheres from said mixture of sheathing compound and purified valepotriate fraction.

8. A valepotriate preparation comprising a purified valerianacea extract and a pharmaceutically acceptable sheathing material in the form of microcapsules.

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4,313,931

## FUSED DIBENZO IMIDAZOLO COMPOUNDS, COMPOSITIONS AND USE

Gerhard Walther, Bingen; Claus S. Schneider, Ingelheim; Karl-Heinz Weber, and Armin Fügner, both of Gau-Algesheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

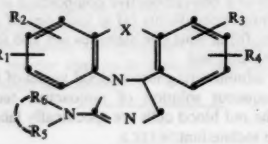
Filed Feb. 23, 1981, Ser. No. 236,818

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1980, 3008944

Int. Cl.³ A61K *31/535, 31/415;* C07D *487/04, 498/04*

U.S. Cl. 424—45 6 Claims

1. A compound of the formula



(I)

wherein

$R_1$, $R_2$, $R_3$, and $R_4$, which may be the same or different, each represent a hydrogen or halogen atom or an alkyl or alkoxy group of from 1 to 6 carbon atoms;

$R_5$ and $R_6$, which may be the same or different, each represent a hydrogen atom, an alkyl group of from 1 to 6 carbon atoms, or an alkenyl group of from 3 to 6 carbon atoms, or $R_5$ and $R_6$ together with the nitrogen atom to which they are attached represent a pyrrolidino, piperidino, or morpholino group; and

X represents oxygen, sulfur, or a methylene group, or a non-toxic, pharmacologically acceptable acid addition salt thereof, or a racemate, enantiomer, or mixture of enantiomers thereof.

4. A method of treating reactions provoked by liberation of histamine or serotonine; bronchial asthma; allergic bronchitis; allergic rhinitis; allergic conjunctivitis; or allergic diathesis in a warm-blooded host, which comprises administering to said host an effective amount of a compound of claim 1.

4,313,932

## DRY SOLIDS MIXED FOR HAIR BLEACHING COMPOSITIONS

Ronald E. Watts, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 8, 1976, Ser. No. 703,369

Claims priority, application United Kingdom, Jul. 14, 1975, 29489/75; Oct. 8, 1975, 41298/75

Int. Cl.³ A61K *7/135*

U.S. Cl. 424—62 1 Claim

1. A dry, solids powder composition for mixing with water to give a hair bleaching composition comprising:

(a) a hydrogen peroxide producer compound comprising 13 to 43% by weight of said powder composition which produces hydrogen peroxide when dissolved in water and which is a stable solid when dry,

(b) an ammonium compound comprising 1.4 to 12.5% by weight of said powder composition which will produce ammonium ions when dissolved in water,

(c) a thickener comprising 14 to 32% by weight of said powder composition which readily disperses in alkaline solution,

(d) an alkaline compound which will give the composition an alkaline pH when it is dissolved in water, the alkaline compound being optionally constituted in part or in total by one or more of the previous components, and

(e) bleach accelerator comprising 13 to 43% by weight of said powder composition selected from the group consisting of (1) alkali metal and ammonium peroxydisulfates and (2) alkali metal and ammonium peroxydiphosphates,

wherein said ammonium compound is ammonium sulfate and in which the thickener is finely divided silica and a synergistic additive selected from the group consisting of (1) a dried acrylic polymer latex which is capable of readily dissolving or dispersing in an aqueous alkaline solution to form a viscous system and (2) a homo- or copolymer of acrylamide which is capable of dissolving in water to give viscous solutions.

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4,313,933

## ACIDIC TWO-BATH TYPE COMPOSITION FOR PERMANENT WAVING OF HAIR AND FOR TREATMENT OF HAIR AND SCALP

Ikue Yamazaki, 32-10, Hakusan-1-chome, Bunkyo-ku, Toyko, Japan

Continuation of Ser. No. 656,207, Feb. 9, 1976, Pat. No. 4,134,411. This application Mar. 4, 1977, Ser. No. 774,457

Claims priority, application Japan, May 9, 1975, 50/107911

The portion of the term of this patent subsequent to Jun. 16, 1996, has been disclaimed.

Int. Cl.³ A61K *7/09*

U.S. Cl. 424—72 23 Claims

1. An acidic, two-bath type composition for the permanent-waving of hair and for the treatment of hair and scalp, which consists of an aqueous reducing agent solution (the first bath) containing 3 to 10% by weight of at least one mercaptan acid and an aqueous oxidizing agent solution (the second bath) containing 1 to 10% by weight of sodium bromate, potassium bromate, or hydrogen peroxide, said reducing agent solution having a pH adjusted with a base to a value 0.1 to 0.5 lower than the isoelectric point of the hair or scalp and said oxidizing agent solution having a pH adjusted with an acid to a value 0.1 to 2.0 lower than the pH of said reducing agent solution but not more than 3.0 lower than the said isoelectric point.

3. An acidic, two-bath type composition according to claim 1, wherein the mercaptan acid is thioglycolic acid.

4,313,934

## PHYSIOLOGICALLY ACTIVE POLYSACCHARIDES, PRODUCTION AND USES THEREOF

Kumpei Kitamura; Shigeru Matsuki, and Kozo Tanabe, all of Takasaki, Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1980, Ser. No. 141,232

Claims priority, application Japan, May 8, 1979, 54-55873; May 8, 1979, 54-55874

Int. Cl.[3] A61K *39/00, 37/00;* C07G *7/00*

U.S. Cl. 424—85 16 Claims

1. A physiologically active polysaccharide which is derived from brewer's yeast cell walls and possesses:

(1) an elemental analysis as follows by weight

| | |
|---|---|
| C | 40.9% ± 1.2% |
| H | 6.0% ± 0.2% |
| N | 1.9% ± 0.1% |
| O | 50.7% ± 1.5% |
| Ash | 0.5% ± 0.05%; |

(2) an average molecular weight determined by an ultrafiltration method of 140,000 to 220,000;

(3) no melting point since no melting point is generally observed in polysaccharides, the active polysaccharide turning brown at about 265° C. and black at about 270° C.;

(4) a specific rotation expressed by $[\alpha]_D^{25} = +75.0$ to $+55.0$ (C=1.0);

(5) an ultraviolet absorption spectrum as shown in FIG. 1, in which no specific absorption is observed;

(6) an infrared absorption spectrum as shown in FIG. 2;

(7) solubility in water and insolubility in methanol, ethanol, ether and acetone;

(8) a positive color reaction in anthrone reaction, Molisch's reaction, ninhydrin reaction, biuret reaction and xanthoproteic reaction;

(9) a pH of a 1% aqueous solution thereof of 5.5 to 6.5; (10) a white color;

(11) 75 to 86% of mannose and 14 to 25% of glucose, a small quantity of glucosamine being detected;

(12) a bond structure of the sugar in which mannose is linked by α-bond since a sugar is liberated therefrom by an α-mannanase; and

(13) constituent amino acids comprising 26 to 32% of serine, 16 to 20% of threonine, 13 to 17% of alanine, 7 to 9% of proline, 5 to 7% of glutamic acid, 5 to 7% of aspartic acid, 4 to 6% of valine, 3 to 5% of lysine, 3 to 4% of glycine, 2.5 to 3.5% of isoleucine, 1.5 to 2.5% of leucine, 0.5 to 1.5% of tyrosine, and 0.3 to 0.7% of phenylalanine.

4,313,935

## ANTIBIOTIC FR-900129 SUBSTANCE, A PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Tadaaki Komori, Takatsuki; Michio Yamashita, Takarazuka; Eiko Iguchi, Osaka; Masanobu Kohsaka, Sakai; Hatsuo Aoki, Ikeda, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Feb. 28, 1980, Ser. No. 125,486

Claims priority, application United Kingdom, Mar. 5, 1979, 07608/79

Int. Cl.[3] A61K *35/00;* C12P *13/00*

U.S. Cl. 424—115 9 Claims

1. FR-900129 substance, its ester and pharmaceutically acceptable salt thereof, wherein the FR-900129 substance has the following physical and chemical properties;

(1) Nature of substance:
Amphoteric

(2) Color reaction:
Positive; iodine reaction, potassium permanganate reaction, ninhydrin reaction and Elson-Morgan reaction
Negative; sulfuric acid reaction, Molish reaction, ferric chloride reaction, Dragendorff reaction, ammoniac silver nitrate reaction, diacetyl reaction

(3) Solubility:
Soluble; water, methanol, ethanol
Insoluble; isopropanol, acetone, ethyl acetate, chloroform

(4) m.p.: 178°–179° C. (dec.)

(5) Specific rotation
$[\alpha]_D^{20} = -69.7°$ (C=0.4 in water)

(6) Ultraviolet absorption spectrum:
$\lambda_{max}^{H2O}$=228 nm ($E_{1cm}^{1\%}$=300)
$\lambda_{max}^{0.01\ N\text{-}HCl}$=228 nm ($E_{1cm}^{1\%}$=300)
$\lambda_{max}^{0.01\text{-}NaOH}$=228 (sh) nm

(7) Infrared absorption spectrum (KBr): (FIG. 1) As shown in the Figure of accompanying drawing,

(8) Elementary analysis:
Qualitative analysis revealed four elements: carbon, hydrogen, nitrogen and oxygen

(9) Thin layer chromatography:

| Stationary phase | Developing solvent | Rf Value |
|---|---|---|
| EASTMAN CHROMAGRAM SHEET*1 | butanol aqueous | 0.15 |
| Silica gel Sheet Merck*2 | 75% aqueous isopropanol | 0.35 |

*1Trade name, made by Eastman Kodak Co., a kind of cellulose sheet.
*2Trade name, made by Merck & Co.

(10) Molecular weight:
From the result of the determination of molecular weight by titration method, it is presumably noted that the molecular weight of FR-900129 substance is between 600 and 700

(11) Nuclear magnetic resonance spectrum: ($^{13}C$ N.M.R.) (Proton decoupling method)
($D_2O$) (ppm from TMS): 13.469, 15.410, 17.533, 17.959, 19.172, 20.506, 21.052, 27.969, 49.204, 51.145, 54.058, 58.304, 63.583, 64.675, 65.585, 122.861, 149.314, 149.736, 167.937, 171.092, 172.859, 175.402, 176.616, 177.043

(12) Nuclear magnetic resonance spectrum (H N.M.R.)
As shown in the Figure of accompanying drawing
($D_2O$) (ppm from TMSP) (FIG. 2)

4,313,936

## BIOLOGICALLY ACTIVE SUBSTANCE, ITS PREPARATION AND COMPOSITIONS CONTAINING IT

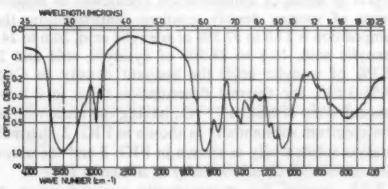
Jean Florent, Boulogne; Jean Lunel, Paris; Denise Mancy, Charenton, and Bernard Vuillemin, Yerres, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Apr. 16, 1980, Ser. No. 140,818

Claims priority, application France, Apr. 18, 1979, 79 09743

Int. Cl.[3] A61K *35/00, 35/74*

U.S. Cl. 424—117 19 Claims




1. The substance designated 41,200 RP which, when isolated from the cells of *Micrococcus sedogenes* M78 (NRRL B-3505), is an amorphous, white, water-soluble powder, containing carbon, hydrogen, oxygen, nitrogen, phosphorus, sulphur, chlorine, sodium and calcium; its elementary composition (calcu-

lated for the dry material) is approximately C=45–47%, H=7.1–7.6%, O=35–38% (by difference), N=4.0–5.7%, P=0.9–1.2%, Cl=0.1–0.4%, S is less than 0.5%, Na=2–.0–3.0%, and Ca=0.9–1.9%; it comprises (in the anhydrous state) 11 to 18% of aminoacids (of which 5.5 to 7.5% is alanine), 10 to 17% of glucose, 10 to 17% of amino-sugars and less than 5% of nucleic acids; its infra-red spectrum (determined on tablets of a mixture with KBr) shows principal absorption bands as follows: 3,420 (very strong; including water), 3,280 (shoulder), 3,090 (shoulder), 2,970 (shoulder), 2,950 (shoulder) 2,920 (strong), 2,845 (medium), 2,680 (shoulder), 2,100 (very weak), 1,730 (shoulder, 1,645 (very strong), 1,545 (strong), 1,460 (shoulder), 1,440 (shoulder), 1,405 (shoulder), 1,375 (strong), 1,335 (shoulder), 1,310 (medium), 1,230 (medium), 1,210 (shoulder), 1,160 (strong), 1,115 (strong), 1,060 (very strong), 1,025 (shoulder), 945 (medium), 900 (weak), 875 (weak), 800 (medium), 775 (weak), 720 (shoulder), 630 (shoulder), 560 (strong; including water), 520 (shoulder), 480 (shoulder), 450 (shoulder), 400 (shoulder) and 365 (shoulder) $cm^{-1}$; and it possesses immunostimulant properties; and alkali metal and alkaline earth metal salts thereof.

18. A pharmaceutical composition for the immunological treatment of cancer or for increasing resistance to viral, bacterial, fungal or parasitic infections which comprises 41, 200 RP as defined in claim 1 or an alkali metal or alkaline earth metal salt thereof in association with a significant quantity of one or more compatible and pharmaceutically acceptable carriers or diluents.

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4,313,937

## METHOD FOR PRODUCING LONG-LASTING ANALGESIC EFFECTS OF β-ENDORPHIN

Tsutomu Oyama, 31, Zaifu-cho, Hirosaki, Aomori, Japan

Filed Aug. 12, 1980, Ser. No. 178,571
Int. Cl.[3] A61K *37/00*
U.S. Cl. 424—177 5 Claims

1. A method for producing analgesia in man which comprises infusing β-endorphin or a physiologically-acceptable salt thereof into the subarachnoid space of the spinal cord or the epidural space of the spinal cord.

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4,313,938

## INTERFERON INDUCER AND METHOD OF PREPARING SAME

Hirofumi Arimura, Toyonaka; Masanori Nagai, Kyoto; Takeshi Yamauchi, Osaka; Tsutomu Kitagawa, Neyagawa, and Tadakazu Suyama, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Jul. 18, 1979, Ser. No. 58,361
Claims priority, application Japan, Jul. 28, 1978, 53/92212
Int. Cl.[3] A01N *9/00*; C12P *19/34*
U.S. Cl. 424—180 4 Claims

1. A double-stranded RNA enzymatically synthesized using native human DNA of human placenta as template, of which the double-stranded moiety is in an amount of at least about 4% between their molecules, the molecular weight is mainly 11–13s in terms of sedimentation coefficient as measured by means of sucrose density gradient centrifugation, the base composition is 27.0 to 37.5% of adenylic acid, 20.6 to 24.7% of guanylic acid, 16.8 to 24.3% of cytidylic acid and 27.8 to 32.7% of uridylic acid, the buoyant density in $Cs_2SO_4$ is 1.653–1.640, the thermal denaturation (Tm) in 0.1 fold the concentration of SSC is 71° C., having the ultraviolet absorption spectrum substantially as shown in FIG. 2, thermal denaturation substantially as shown in FIG. 3 and the absorbance ratio at 25°–90° C. substantially as shown in FIG. 4.

2. A process for enzymatically synthesizing a double-stranded RNA of claim 1 using native human DNA as template, which comprises:

(1) reacting ATP, GTP, CTP and UTP with with one another in the presence of native human DNA of human placenta as template by catalytic action of an active RNA polymerase of *Micrococcus lysodeiticus* or of *Escherichia coli* for 2 to 4 hours at 20° to 40° C. in a tris-HCl buffer solution at pH of 7.0 to 8.0 to form RNA and then terminating the reaction,

(2) subjecting the formed RNA to treatment to free it from protein,

(3) concentrating the RNA from step (2),

(4) centrifuging the resulting RNA on a CsCl cushion followed by ethanol-precipitation,

(5) dissolving the centrifuged RNA from step (4) in a compatible saline solution at a pH of from 6.5 to 7.5; and

(6) heating the resulting RNA at a temperature of 70° to 100° C. then rapidly cooling to room temperature or below to anneal the resulting RNA.

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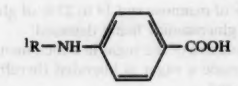
4,313,939

## PHARMACEUTICAL COMPOSITION CONTAINING PARA-AMINOBENZOIC ACID-N-L-RHAMNOSIDE AS AN ACTIVE INGREDIENT

Chikao Yoshikumi, Kunitachi; Yoshio Ohmura, Funabashi; Fumio Hirose, Tokyo; Masanori Ikuzawa, Tachikawa; Kenichi Matsunaga, Tokyo; Takayoshi Fujii, Tokyo; Minoru Ohhara, Tokyo, and Takao Ando, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 39,218, May 15, 1979, abandoned. This application Dec. 11, 1979, Ser. No. 102,535
Int. Cl.[3] A61K *31/70*
U.S. Cl. 424—180 5 Claims

1. A method for the treatment of hypertension, which comprises administering to a mammal suffering from hypertension, an effective amount of a compound of the formula:




(1)

wherein $^1R$ denotes the residual group formed by removing OH at 1 position from rhamnose, or a pharmaceutically acceptable salt thereof.

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4,313,940

## GRANULAR PESTICIDAL COMPOSITIONS OF DECREASED DERMAL TOXICITY AND METHODS FOR PREPARING THE SAME

Nunzio R. Pasarela, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 19, 1980, Ser. No. 151,022
Int. Cl.[3] A01N *57/00*
U.S. Cl. 424—215 7 Claims

1. A particulated, pesticidal composition comprising: 2% by weight to 10% by weight of O,O-diethyl-S-(t-butylthio)methyl phosphorodithioate, 1% by weight to 20% by weight of tall oil or a vegetable oil selected from the group consisting of soybean oil and corn oil, or tall oil fatty acids, and sufficient amount of corncob grits to total said composition to 100%.

4,313,941

## STABILIZED GRANULAR NEMATICIDAL AND INSECTICIDAL COMPOSITION HAVING O-ETHYL-S,S-DIPROPYL DITHIOPHOSPHATE AS AN ACTIVE SUBSTANCE

Hendrik Duinker, and Willem de Lange, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Netherlands

Continuation of Ser. No. 10,272, Feb. 7, 1979, abandoned. This application Apr. 7, 1980, Ser. No. 137,350

Claims priority, application Netherlands, Feb. 9, 1978, 7801475

Int. Cl.³ A01N *57/40*; C07F *9/165*

U.S. Cl. 424—225 8 Claims

1. A stabilized granular nematicidal and insecticidal composition comprising O-ethyl-S,S,-dipropyl dithiophosphate, in an nematicidally and/or insecticidally effective amount and, as a carrier and as essentially the sole stabilizer, pumice granules in an amount sufficient to stabilize said composition.

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4,313,942

## ACTIVATED VITAMIN D RODENTICIDES

Hector F. DeLuca; Heinrich K. Schnoes, both of Madison; Herbert E. Paaren, Verona, and Helen Frank, Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Oct. 9, 1979, Ser. No. 83,023

Int. Cl.³ A61K *31/59*

U.S. Cl. 424—236 11 Claims

1. A process for improving the rodenticidal efficacy of vitamin D compounds which comprises:

(1) treating vitamin D compounds with an alkyl- or phenylsulfonyl halide whereby a product comprising the 3-sulfonyl derivatives of the vitamin D- compound is obtained;

(2) subjecting the product from step (1) to alcoholysis under buffered conditions in a low molecular weight alcohol whereby a product comprising the corresponding cyclovitamin D is obtained;

(3) allylically oxidizing the product obtained in step (2), utilizing $SeO_2$ as the oxidizing agent, whereby a product comprising the 1α-hydroxylated cyclo-vitamin D is obtained;

(4) treating the product obtained in step (3) with a low molecular weight organic carboxylic acid to obtain a product comprising the corresponding 1α-hydroxy-3-0-acyl vitamin D compound;

(5) treating the product obtained in step (4) with a dilute alcoholic base whereby a product comprising the corresponding 1α-hydroxy vitamin D compounds is obtained; and

(6) recovering the product of step (5).

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4,313,943

## 7-CHLORO-2,3-DIHYDRO-5-PHENYL-1-PROPARGYL-1H-1,4-BENZODIAZEPINE-2-ONE, AND A PHARMACEUTICAL COMPOSITION THEREOF

Luigi Molteni, Corso Porta Romana, 69; Franco Tenconi, Via Palestrina 20, and Renato Tagliabue, Via Veneto 3, all of Milan, Italy

Continuation-in-part of Ser. No. 383,993, Jul. 30, 1973, abandoned. This application Aug. 19, 1976, Ser. No. 715,690

Claims priority, application Italy, Aug. 9, 1972, 28048 A/72

Int. Cl.³ C07D *243/24*; A61K *31/55*

U.S. Cl. 424—244 2 Claims

1. 7-Chloro-2,3-dihydro-5-phenyl-1-propargyl-1H-1,4-benzodiazepin-2-one and pharmaceutically acceptable acid addition salts thereof.

2. A pharmaceutical composition having high anxiolytic and relatively low myorelaxant properties comprised of an active compound selected from the group consisting of a pharmaceutically effective amount of 7-chloro-2,3-dihydro-5-phenyl-1-propargyl-1H-1,4-benzodiazepin-2-one and pharmaceutically acceptable acid addition salts thereof and a suitable pharmaceutical carrier.

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4,313,944

## CYCLOHEPTINDOLES, COMPOSITIONS AND USE

Lucien Nedelec, Le Raincy; Daniel Frechet, Paris, and Claude Dumont, Nogent sur Marne, all of France, assignors to Roussel Uclaf, Paris, France

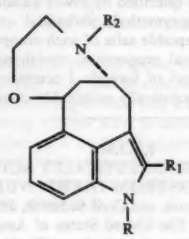
Filed Feb. 23, 1981, Ser. No. 237,062

Claims priority, application France, Feb. 26, 1980, 80 04198

Int. Cl.³ A61K *31/535*; C07D *498/04*

U.S. Cl. 424—248.4 18 Claims

1. a compound selected from the group consisting of optically active isomers and racemic mixtures of cycloheptindoles of the formula



I

wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms and optionally substituted aralkyl of 7 to 12 carbon atoms, $R_1$ is selected from the group consisting of hydrogen, chlorine and bromine and $R_2$ is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, cycloalkylalkyl of 4 to 7 carbon atoms, alkenyl and alkynyl of 3 to 7 carbon atoms and optionally substituted aralkyl of 7 to 12 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

7. An antianoxic and dopaminergic agonist composition comprising an antianoxically and dopaminergic agonistically effective amount of at least one compound of claim 1 and a pharmaceutical carrier.

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4,313,945

## 7-THIAZOLYL-ACETAMIDO-CEPHEM DERIVATIVES WITH TERMINAL AMINOCARBOXYLIC ACID GROUPING

Rene Wiederkehr, Pfeffingen, and Riccardo Scartazzini, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

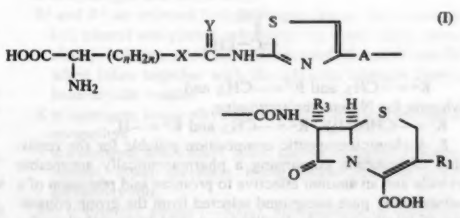
Filed Nov. 13, 1979, Ser. No. 93,645

Claims priority, application Switzerland, Nov. 23, 1978, 12025/78

Int. Cl.³ A61K *31/545*; C07D *501/20*

U.S. Cl. 424—246 12 Claims

1. Aminothiazolacetamido-3-cephem-4-carboxylic acid compounds of the formula



(I)

wherein the index n represents an integer of 1 to 4, X repre-

sents oxygen, sulphur, an —NH— group or the direct bond, Y represents oxygen or sulphur, A represents methylene or methylene substituted by amino, hydroxy, carboxyl, sulpho, oxo, or by the group =N—O—$R^o$ in which $R^o$ represents hydrogen, lower alkyl, or lower alkyl substituted by lower alkoxy, halogen, hydroxy, lower alkanoyloxy, sulfo, carboxy or lower alkoxycarbonyl, $R_1$ represents hydrogen, lower alkyl, lower alkoxy, halogen or a group of the formula $—CH_2—R_2$, in which $R_2$ represents lower alkanoyloxy, carbamoyloxy, N-lower alkylcarbamoyloxy, triazolylthio, tetrazolylthio, thiazolylthio, thiatriazolylthio, thiadiazolylthio, oxazolylthio, oxadiazolylthio or pyridinium, wherein the heterocyclic rings are unsubstituted or substituted by lower alkyl, N,N-di-lower alkylamino-lower alkyl, carboxy-lower alkyl, sulpho-lower alkyl, amino, carboxy-lower alkanoylamino or carbamoyl, and $R_3$ represents hydrogen or methoxy, and wherein the carboxyl groups are free or are esterified by lower alkanoyloxymethyl, aminolower alkanoyloxymethyl, phthalidyl or indanyl and pharmaceutically acceptable salts of such compounds.

**11.** A pharmaceutical preparation containing an effective amount of a compound of formula I according to claim **1**, together with pharmaceutically acceptable carriers.

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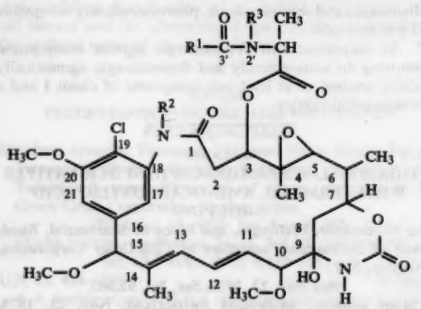
**4,313,946**

## CHEMOTHERAPEUTICALLY ACTIVE MAYTANSINOIDS FROM *TREWIA NUDIFLORA*

**Richard G. Powell, Peoria, and Cecil R. Smith, Jr., Dunlap, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.**

**Filed Jan. 27, 1981, Ser. No. 228,853**
**Int. Cl.³ A61K *31/535*; C07D *498/18***
**U.S. Cl. 424—248.54** **8 Claims**

**1.** A substantially pure compound selected from the group consisting of trewiasine, dehydrotrewiasine, and N-demethyltrewiasine, characterized by the formula



wherein for trewiasine:
$R^1$=—$CH(CH_3)_2$, $R^2$=—$CH_3$, and $R^3$=—$CH_3$;
wherein for dehydrotrewiasine:
$R^1$=

$R^2$=—$CH_3$, and $R^3$=—$CH_3$; and
wherein for N-demethyltrewiasine:
$R^1$=—$CH(CH_3)_2$, $R^2$=—$CH_3$, and $R^3$=—H.

**5.** A chemotherapeutic composition suitable for the remission of leukemia comprising a pharmaceutically acceptable vehicle and an amount effective to promote said remission of a substantially pure compound selected from the group consisting of trewiasine, dehydrotrewiasine, and N-demethyltrewiasine.

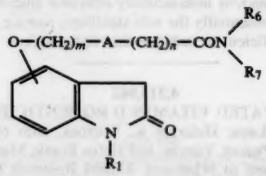
**4,313,947**

## PLATELET AGGREGATION INHIBITING 2-OXYINDOLES, THEIR COMPOSITIONS AND METHOD OF USE

**Kazuyuki Nakagawa, Tokushima; Minoru Uchida, Komatsushima, and Kimiaki Oka, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 806,926, Jun. 15, 1977, Pat. No. 4,216,225, which is a division of Ser. No. 588,475, Jun. 19, 1975, Pat. No. 4,070,470. This application Jul. 18, 1979, Ser. No. 58,467**
**The portion of the term of this patent subsequent to Aug. 5, 1997, has been disclaimed.**
**Int. Cl.³ C07D *209/04***
**U.S. Cl. 424—248.54** **4 Claims**

**1.** A compound of the formula:



where $R_1$ is selected from the group consisting of hydrogen, $C_{1-4}$ alkyl, $C_{2-4}$ alkenyl, benzyl and phenethyl; A is —CH=CH— or

wherein $R_2$ or $R_3$ may be the same or different and are selected from the group consisting of hydrogen and $C_{1-4}$ alkyl; $R_6$ and $R_7$ may be the same or different and are selected from the group consisting of hydrogen, $C_{1-4}$ alkyl, benzyl, phenethyl and together with the nitrogen atom, a heterocyclic group selected from the group consisting of a piperidino, morpholino, piperazino or thiazolino group; and m and n each are zero or a positive integer with m+n being no more than 11.

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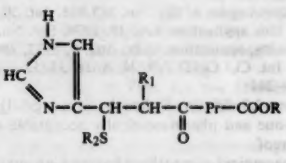
**4,313,948**

## HYPOTENSIVE IMIDAZOLE SUBSTITUTED MERCAPTO-1-OXOPROPYL-L-PROLINES

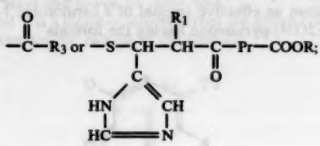
**Miguel A. Ondetti, and Denis E. Ryono, both of Princeton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Filed Nov. 20, 1980, Ser. No. 208,739**
**Int. Cl.³ A61K *31/415*; C07D *403/06***
**U.S. Cl. 424—273 R** **6 Claims**

**4.** A composition for treating hypertension comprising a pharmaceutically acceptable carrier and a pharmaceutically effective amount of a hypotensive agent or pharmaceutically acceptable salt thereof of the formula

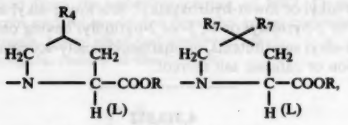


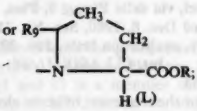
wherein
R is hydrogen or lower alkyl;
$R_1$ is hydrogen, lower alkyl, or halo substituted lower alkyl;
$R_2$ is hydrogen,



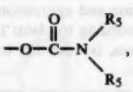
$R_3$ is lower alkyl, phenyl, or phenyl-lower alkyl;

Pr-COOR is a substituted or unsubstituted proline of the structures





$R_4$ is hydrogen, lower alkyl, hydroxy, halogen, keto, azido, a saturated cycloalkyl ring of 3 to 7 carbons,

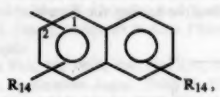


-Y-$R_6$, phenyl, phenyl-lower alkyl, substituted phenyl, or substituted phenyl-lower alkyl wherein said phenyl substituent is lower alkyl, lower alkoxy, lower alkylthio, Cl, Br, F, or hydroxy;

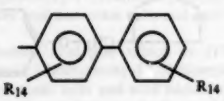
$R_5$ is hydrogen or lower alkyl;

Y is oxygen or sulfur;

$R_6$ is lower alkyl, lower alkenyl, lower alkynyl, phenyl, phenyl-lower alkyl, substituted phenyl or substituted phenyl-lower alkyl wherein said phenyl substituted is lower alkyl, lower alkoxy, lower alkylthio, Cl, Br, F, or hydroxy, substituted or unsubstituted 1- or 2-naphthyl of the formula



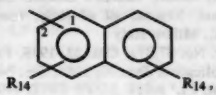
or substituted or unsubstituted biphenyl of the formula



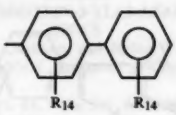
wherein $R_{14}$ is hydrogen, methyl, methoxy, methylthio, Cl, Br, F, or hydroxy;

$R_7$ is halogen or -Y-$R_8$;

$R_8$ is lower alkyl, phenyl, phenyl-lower alkyl, substituted phenyl-lower alkyl wherein said phenyl substituent is lower alkyl, lower alkoxy, lower alkylthio, Cl, Br, F, or hydroxy, substituted or unsubstituted 1- or 2-naphthyl of the formula



substituted or unsubstituted biphenyl of the formula



wherein $R_{14}$ is as defined above, or when the $R_8$ groups are lower alkyl they join to complete an unsubstituted 5- or 6-membered ring or such ring wherein a carbon atom is substituted by a lower alkyl or di(lower alkyl) group; and

$R_9$ is keto, phenyl, 2- or 4-hydroxyphenyl.

6. The method of alleviating hypertension which comprises administering to a mammalian specie an effective amount of the composition of claim 4.

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**4,313,949**

## METHOD OF PRODUCING AN INHIBITORY EFFECT ON BLOOD PLATELET AGGREGATION

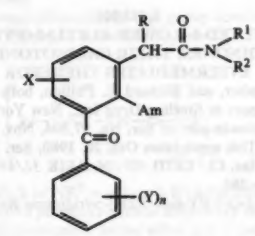
James R. Shanklin, Jr.; Dwight A. Shamblee, and David A. Walsh, all of Richmond, Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Division of Ser. No. 78,860, Sep. 26, 1979. This application Feb. 17, 1981, Ser. No. 234,532

Int. Cl.³ A61K *31/535, 31/165*

U.S. Cl. 424—248.56 9 Claims

1. The method of producing an inhibitory effect on blood platelet aggregation which comprises administering to a living animal body a blood platelet inhibitory effective amount of a compound having the formula:



wherein;

R is hydrogen and lower alkyl,

$R^1$ and $R^2$ are selected from hydrogen, lower alkyl, cycloalkyl, phenyl and phenyl substituted by lower alkyl, lower alkoxy, halogen, nitro and trifluoromethyl, and $R^1$ and $R^2$ when taken together with the adjacent nitrogen form a heterocyclic residue,

X is hydrogen, lower alkyl, lower alkoxy, halogen and trifluoromethyl,

Y is hydrogen, lower alkyl, lower alkoxy, halogen, trifluoromethyl, lower alkylthio, lower alkyloxythio or lower alkyldioxythio,

Am is primary amino ($—NH_2$), methylamino or dimethylamino, and

n is 1-3 inclusive.

**4,313,950**

## ANTIREPRODUCTIVE TRICYCLIC ORTHO-FUSED NITROGEN CONTAINING COMPOUNDS

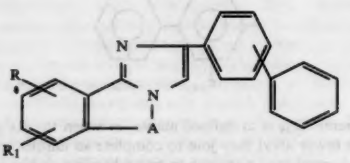
**Umberto Guzzi, Milan; Amedeo Omodei-Sale, Voghera, and Giulio Galliani, Monza, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy**

**Division of Ser. No. 87,371, Oct. 23, 1979, Pat. No. 4,275,066. This application Jan. 30, 1981, Ser. No. 230,138**

**Int. Cl.³ A61K *31/47*; C07D *471/04***

**U.S. Cl. 424—258** **8 Claims**

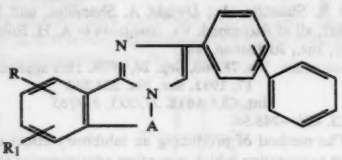
**1.** A tricyclic orthofused nitrogen containing compound of formula



I

wherein R and $R_1$ are independently selected from hydrogen, fluoro, chloro, bromo and ($C_{1-4}$)alkoxy; A may be $—CH_2—$, $—CH_2—CH_2—$, —CH=CH— or $—(CH_2)_3—$; or a salt therewith of a pharmaceutically-acceptable acid.

**5.** A method for preventing reproduction in warm-blooded animals, which comprises administering to the animal a dosage varying from about 0.1 to about 25 mg/kg of body weight of a compound of formula



wherein A, R, and $R_1$ are defined as in claim **1**.

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**4,313,951**

## 3-SUBSTITUTED-6-(LOWER-ALKYL)-5-(PYRIDINYL)-2(1H)-PYRIDINONES, THEIR CARDIOTONIC USE AND INTERMEDIATES THEREFOR

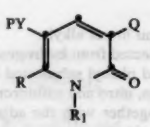
**George Y. Lesher, and Richard E. Philion, both of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 97,504, Nov. 26, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 198,461**

**Int. Cl.³ C07D *401/04*; A61K *31/44***

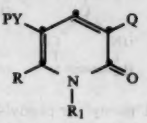
**U.S. Cl. 424—263** **26 Claims**

**1.** A 1-$R_1$-3-Q-5-PY-6-R-2(1H)-pyridinone having the formula



where Q is amino, cyano, carbamyl, halo, lower-alkylamino, di-(lower-alkyl)amino or lower-acylamino, $R_1$ is hydrogen, lower-alkyl or lower-hydroxyalkyl, R is lower-alkyl and PY is 4-, 3- or 2-pyridinyl or 4-, 3- or 2-pyridinyl having one or two lower-alkyl substituents, or pharmaceutically-acceptable acid-addition or cationic salt thereof.

**24.** The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient an effective amount of a cardiotonic 1-$R_1$-3-Q-5-PY-6-R-2(1H)-pyridinone having the formula



where Q is amino, cyano, carbamyl, halo, lower-alkylamino, di-(lower-alkyl)amino or lower-acylamino, $R_1$ is hydrogen, lower-alkyl or lower-hydroxyalkyl, R is lower-alkyl and PY is 4-, 3- or 2-pyridinyl or 4-, 3- or 2-pyridinyl having one or two lower-alkyl substitutents, or pharmaceutically-acceptable acid-addition or cationic salt thereof.

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**4,313,952**

## METHOD OF TREATING ACUTE ALCOHOLIC INTOXICATION WITH PYRIDOXINE P.C.A.

**Massimo Baldacci, via delle Piagge 9, Pisa, Italy**

**Filed Dec. 8, 1980, Ser. No. 214,033**

**Claims priority, application Italy, Jun. 30, 1980, 23103 A/80**

**Int. Cl.³ A61K *31/44***

**U.S. Cl. 424—263** **2 Claims**

**1.** A method for the treatment of acute alcoholic intoxication and reducing psychomotor excitation and aggression, comprising administering to a person suffering therefrom pyridoxine pyrrolidone-carboxylate, by the parenteral or oral route in an amount sufficient to treat said intoxication and reduce said psychomotor excitation and aggression.

**2.** The method according to claim **1**, wherein said amount, expressed in unit doses, is from 150 to 300 mg of pyridoxine pyrolidone carbonate.

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**4,313,953**

## HETEROCYCLIC DERIVATIVES OF (4-ARYLOXYMETHYL-1,3-DIOXOLAN-2-YL)METHYL-1H-IMIDAZOLES AND 1H-1,2,4-TRIAZOLES

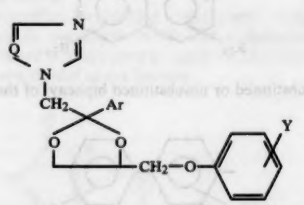
**Jan Heeres, Vosselaar, and Joseph H. Mostmans, Antwerp, both of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium**

**Division of Ser. No. 20,287, Mar. 14, 1979, Pat. No. 4,218,458, which is a continuation-in-part of Ser. No. 918,257, Jun. 23, 1978, abandoned. This application Mar. 27, 1980, Ser. No. 134,384**

**Int. Cl.³ C07D *263/30, 277/20***

**U.S. Cl. 424—269** **5 Claims**

**1.** A chemical compound selected from the group consisting of an azole derivative having the formula:



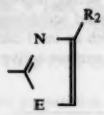
and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is a member selected from the group consisting of CH and N;

Ar is a member selected from the group consisting of thienyl, halothienyl, phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents each

independently selected from the group consisting of halo, lower alkyl and lower alkyloxy; and

the radical Y is a member selected from the group consisting of a heterocyclic radical of the formula



(b)

wherein $R^2$ is selected from the group consisting of hydrogen, lower alkyl and aryllower alkyl and E is a member selected from the group consisting of $NR^3$, O and S, wherein said $R^3$ is selected from the group consisting of hydrogen, lower alkyl and aryllower alkyl;

a heterocyclic radical of the formula

(c)

wherein $R^4$ is selected from the group consisting of hydrogen, lower alkylthio, aryllower alkylthio, lower alkyl and aryllower alkyl and G is a member selected from the group consisting of $NR^5$, O and S, wherein said $R^5$ is selected from the group consisting of hydrogen, lower alkyl and aryllower alkyl, provided that said G is $NR^5$ when said $R^4$ stands for alkylthio;

a heterocyclic radical of formula

(d)

wherein A is selected from the group consisting of O and $NR^6$, said $R^6$ being selected from the group consisting of hydrogen, lower alkyl, hydroxylower alkyl, aryl and aryllower alkyl;

wherein said aryl as used in the foregoing definitions is selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy and trifluoromethyl.

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## 4,313,954

## 6,9-NITRILO-PROSTAGLANDIN ANALOGUES

**Hirohisa Wakatsuka; Masaki Hayashi, and Yoshitaka Konishi, all of Takatsuki, Japan, assignors to Ono Pharmaceutical Co. Ltd., Osaka, Japan**

**Filed Feb. 19, 1980, Ser. No. 122,704**

**Claims priority, application Japan, Feb. 20, 1979, 54-17935**

**Int. Cl.³ A61K** *31/40;* **C07D** *209/52*

**U.S. Cl. 424—274** **4 Claims**

1. A prostaglandin analogue which is (13E)-(9α,11α,15α)-6,9-nitrilo-11,15-dihydroxy-17,20-dimethylprost-13-enoic acid and its methyl ester and non-toxic salts and acid addition salts thereof.

2. A prostaglandin analogue which is (13E)-(9α,11α,15α,17S)-6,9-nitrilo-11,15-dihydroxy-17,20-dimethylprost-13-enoic acid and non-toxic salts and acid addition salts thereof.

3. A prostaglandin analogue which is (13E)-(9α,11α,15α,17S)-6,9-nitrilo-11,15-dihydroxy-17,20-dimethylprost-13-enoic acid methyl ester and non-toxic acid addition salts thereof.

4. A pharmaceutical composition useful in the treatment of hypertension or disorders of the peripheral circulation, or in the prevention and treatment of cerebral thrombosis, myocardial infarction and arteriosclerosis, or in the treatment of gastric ulceration, which comprises as active ingredient an effective amount of at least one prostaglandin analogue selected from the class consisting of (13E)-(9α,11α,15α)-6,9-nitrilo-11,15-dihydroxy-17,20-dimethylprost-13-enoic acid, (13E)-(9α,11α,15α, 17S)-6,9-nitrilo-11,15-dihydroxy-17,20-dimethylprost-13-enoic acid, or a non-toxic salt or non-toxic acid addition salt of a said acid, the methyl ester of a said acid or a non-toxic acid addition salt of the methyl ester, in association with a pharmaceutical carrier or coating.

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## 4,313,955

## 1,5-BIS(1,4-BENZODIOXIN-2-YL)-3-AZAPENTANE-1,5-DIOLS

**Charles F. Huebner, Chatham, and Heinz W. Gschwend, New Providence, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Oct. 14, 1980, Ser. No. 196,503**

**Int. Cl.³ A61K** *31/335;* **C07D** *319/20*

**U.S. Cl. 424—278** **8 Claims**

1. The 1-(2,3-dihydro-1,4-benzodioxin-2S-yl)-5-(2,3-dihydro-1,4-benzodioxin-2R-yl)-3-azapentane-1R,5S-diol, or a pharmaceutically acceptable acid addition salt thereof.

6. An antihypertensive pharmaceutical composition comprising an antihypertensive amount of a compound as claimed in claim 1, together with a pharmaceutical excipient.

8. The method of reducing elevated blood pressure in a mammal in need thereof, which consists of administering to said mammal enterally or parenterally an effective dosage of a composition as claimed in claim 6.

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## 4,313,956

## NOVEL SYPATHOMIMETIC AMINE PRODRUGS

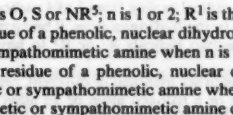
**Nicholas S. Bodor, Gainesville, Fla.; Kenneth B. Sloan, Eudora, and Stefano A. Pogany, Lawrence, both of Kans., assignors to INTERx Research Corp., Lawrence, Kans.**

**Filed Dec. 28, 1979, Ser. No. 108,055**

**Int. Cl.³ C07C** *149/40;* **A61K** *31/265;* **C07C** *79/46, 101/72, 102/00, 101/44;* **A61K** *31/165;* **C07C** *103/20, 97/16;* **C09F** *5/08;* **C07C** *153/00, 69/76, 69/00, 67/02, 101/20, 69/74, 67/02;* **A61K** *31/25, 31/235, 31/245, 31/22, 31/26, 31/255, 31/275, 31/215;* **C07C** *101/30, 101/02, 69/66, 69/34;* **A61K** *31/23, 31/225, 31/22, 31/16;* **C07C** *101/00, 79/40, 101/26*

**U.S. Cl. 424—301** **36 Claims**

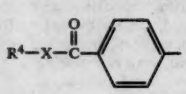
1. A compound selected from the group consisting of those having (i) the structural formula (I):



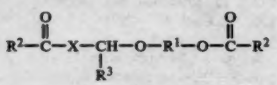
(I)

wherein X is O, S or $NR^5$; n is 1 or 2; $R^1$ is the monodehydroxylated residue of a phenolic, nuclear dihydroxy natural sympathetic or sympathomimetic amine when n is 1, and the didehydroxylated residue of a phenolic, nuclear dihydroxy natural sympathetic or sympathomimetic amine when n is 2, said natural sympathetic or sympathomimetic amine comprising a basic nucleus selected from the group consisting of epinephrine, norepinephrine, isoproterenol, isoetharine, protochylol, adrenalone, dihydroxyphenylaminobutanol, nordefrin, colterol, fenoterol, metaproterenol, terbutaline, carbidopa and methyldopa; $R^2$ is selected from the group consisting of straight or branched chain alkyl having from 1 to 20 carbon atoms; aryl having from 6 to 10 carbon atoms; cycloalkyl having from 3 to 8 carbon atoms; alkenyl having from 2 to 20 carbon atoms; cycloalkenyl having from 4 to 8 carbon atoms; alkynyl having from 2 to 20 carbon atoms; aralkyl, alkaryl, aralkenyl, aralkynyl, alkenylaryl, alkynylaryl loweracyloxyalkyl, and carboxyalkyl, wherein alkyl, aryl, alkenyl and alkynyl are as defined above; and mono- or poly-substituted derivatives of the above,

each of said substituents being selected from the group consisting of lower alkyl, lower alkoxy, lower acyl, lower acyloxy, halo, haloloweralkyl, cyano, carbethoxy, loweralkylthio, amino, nitro, loweralkylamino, diloweralkylamino, carboxyl, carbamyl, loweralkylcarbamyl, diloweralkylcarbamyl and



wherein $R^4$ is hydrogen or alkyl having from 1 to 10 carbons; $R^3$ is hydrogen, $R^2$, lower acyl, cyano, halololoweralkyl, carbamyl, loweralkylcarbamyl, diloweralkylcarbamyl, $—CH_2ONO_2$ and $—CH_2OCOR^2$; $R^5$ is hydrogen or lower alkyl; (ii) the structural formula (II):



(II)

wherein X, $R^2$ and $R^2$ and $R^3$ are as defined above and $R^1$ is the didehydroxylated residue of a phenolic, nuclear dihydroxy natural sympathetic or sympathomimetic amine as defined above; and (iii) the non-toxic, pharmaceutically acceptable salts thereof.

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**4,313,957**

**PESTICIDAL SULFUR CONTAINING AMIDES DERIVED FROM ANILINE AND THE METHOD OF PREPARATION THEREOF**

**Jean Abblard, St. Didier au Mont d'Or, and Guy Lacroix, Lyons, both of France, assignors to Rhone-Poulenc Agrochimie, France**

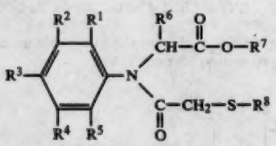
**Filed Jan. 23, 1980, Ser. No. 114,519**

**Claims priority, application France, Jan. 24, 1979, 79 02580**

**Int. Cl.³ A01N** *37/14, 37/10;* **C07C** *153/023*

**U.S. Cl. 424—301** **9 Claims**

**1.** A compound, useful as a pesticide, of the formula:



in which

$R^1$ and $R^5$, which are identical or different, represent an alkyl or alkoxy radical having from 1 to 4 carbon atoms or a halogen atom or the hydrogen atom, it being possible for only one of the two radicals $R^1$ or $R^5$ to have this last meaning,

$R^2$, $R^3$ and $R^4$, which are identical or different, represent the hydrogen atom or a halogen atom or an alkyl or alkoxy radical having from 1 to 4 carbon atoms,

$R^6$ represents the hydrogen atom or a methyl radical,

$R^7$ represents the hydrogen atom or an alkyl radical having from 1 to 12 carbon atoms and

$R^8$ represents a radical of the formula $R^9—CO—$, in which $R^9$ is an organic radical which represents a linear or branched alkyl or alkenyl radical which has at most 18 carbon atoms and can be substituted by halogen atoms or hydroxyl, mercaptan, cyano or oxo groups or alkoxy, alkylthio, aryl, alkoxycarbonyl or alkanoylamino radicals, these various radicals having at most 6 carbon atoms, a cycloalkyl radical which contains 3 to 7 carbon atoms in the ring and can be substituted by halogen atoms or alkyl groups having at most 4 carbon atoms, a phenyl or naphthyl radical which is optionally substituted by halogen atoms or alkyl, alkanoyl-oxy, alkanoyl or alkoxy groups, these various groups having at most 6 carbon atoms.

**7.** A composition useful for protecting plants against fungal diseases comprising as the active ingredient, a fungicidally effective amount of a compound according to one of claims **1, 2, 3, 5** or **6**, in association with an inert carrier and optionally, an agriculturally acceptable surface-active agent.

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**4,313,958**

**METHOD OF PRODUCING ANALGESIA**

**Thomas R. LaHann, Cleves, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Oct. 24, 1980, Ser. No. 200,102**

**Int. Cl.³ A61K** *31/165*

**U.S. Cl. 424—324** **6 Claims**

**1.** A method for treating pain in humans and lower animals in need of such treatment, comprising administering to the human or lower animals a safe and effective amount of capsaicin.

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**4,313,959**

**(ARYLMETHYL)PHENYL-AMINOCYCLOHEXANOLS, CYCLOHEXENES AND INTERMEDIATES THEREOF**

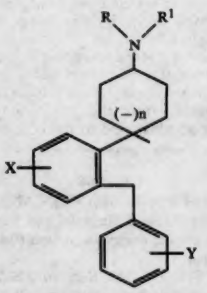
**Lawrence L. Martin, Lebanon, N.J., and Manfred Worm, Wiesbaden-Naurod, Fed. Rep. of Germany, assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.**

**Filed Apr. 27, 1981, Ser. No. 258,097**

**Int. Cl.³ A61K** *31/315;* **C07C** *91/16, 87/36*

**U.S. Cl. 424—330** **20 Claims**

**1.** A compound of the formula



wherein R and $R^1$ are each independently hydrogen and lower alkyl, $R^2$ is hydrogen and hydroxyl; m is an integer of 0 or 1; n is an integer of 0 or 1; and when m is 1, n is 0; and when m is 0, n is 1; and X and Y are each independently hydrogen, halogen, alkoxyl of 1 or 2 carbon atoms, lower alkyl, hydroxy and trifluoromethyl; and the stereoisomers thereof and a pharmaceutically acceptable acid addition salt of any of the foregoing.

**13.** A method of treatment which comprises administering to a depressed patient a pharmaceutically effective amount of a compound defined in claim **1**.

**17.** An antidepressant or anticonvulsant pharmaceutical composition which comprises an effective amount of a compound defined in claim **1** and a pharmaceutically acceptable carrier thereof.

## 4,313,960
## PREPARATION OF CONCENTRATED NATURAL VINEGAR

Constant J. V. L. Campagne, Bilthoven, Netherlands, assignor to Luycks Producten B.V., Ad Diemen, Netherlands

Filed Jan. 9, 1980, Ser. No. 110,746
Claims priority, application Netherlands, Jan. 10, 1979, 7900196
Int. Cl.[3] C12J *1/00;* C12P *7/54, 7/62*
U.S. Cl. 426—17 2 Claims

1. A process for the preparation of a concentrated flavored natural vinegar which comprises freeze concentrating natural vinegar to produce a vinegar having an acetic acid concentration of at least 20% (weight/volume), adding to the concentrated vinegar at least one alcohol including ethanol obtained by natural fermentation, storing the resulting mixture for 2–5 days so as to produce a concentrated natural vinegar containing ethyl acetate in such an amount that the weight ratio of ethyl acetate to acetic acid is at least 1:150, the amount of ethanol added being such that the weight of the sum of the amount of ethanol and ethyl acetate to the amount of acetic acid is at least 1:20.

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## 4,313,961
## METHOD OF MAKING A COMPLETE MEAL FOOD PRODUCT

Enrico Tobia, Fleischmanns, N.Y. 12430

Continuation of Ser. No. 31,543, Apr. 19, 1979, abandoned. This application Sep. 29, 1980, Ser. No. 191,956
Int. Cl.[3] A21D *13/00, 13/08;* A23J *1/20;* A23L *1/00*
U.S. Cl. 426—19 3 Claims

1. A method of making a food product which comprises:
forming a milk curd as follows;
heating two quarts of milk to a temperature range of 180° Farenheit to 185° Farenheit,
stirring four and one-half ounces of lemon juice into the heated milk until a curd rises to the surface of the heated milk,
removing the milk from the heat,
separating the curd from the milk by straining,
cooling the curd,
crumbling the curd;
preparing a pastry dough by mixing by proportion with the cooled and crumbled milk curd the following:
½ oz. salt
2½ oz. white corn syrup
10 oz. luke warm water
1 oz. yeast
1 lb. 9 oz. high gluten flour
rolling the dough into a sheet, said sheet requiring approximately seven ounces of dough to form a nine by seven inch oval sheet with a thickness of about one-quarter inch with a border of about one-half inch in thickness;
removing a section of the dough from the said sheet;
coating the remaining of said sheet with a sauce;
preparing a pastry dough by mixing together by proportion the following:
8 oz. flour
½ oz. yeast
6 oz. water
2 oz. Sugar
1 whole egg
preparing a dessert filling by mixing together by proportion the following:
1 lb. riccotta impastata
10 oz. granulated sugar
3 oz. raisins
2 oz. chocolate chips
wrapping the prepared pastry filling within the pastry dough to form a filled pastry;
inserting the filled pastry into the sheet where the section of the dough was removed;
prebaking together the sauce coated sheet and the inserted filled pastry at approximately 400 degrees Farenheit for approximately four minutes;
separately precooking at least two edible items;
placing the precooked edible items separately on the prebaked sauce coated sheet, said edible items including a pasta and a meat; and baking together the prebaked filled pastry and the prebaked sauce coated sheet with the two precooked edible items on it at approximately 450 degrees Farenheit for a time range of seven to ten minutes, to produce a fully cooked product suitable for consumption, the sheet of baked dough containing the two edible items being sufficiently flexible after baking to be bent over the edible items without breaking.

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## 4,313,962
## PRODUCTION OF LOW CHOLESTEROL CASEIN

Chong Y. Kim, Elkhart, and Moshe M. Sternberg, South Bend, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 16, 1980, Ser. No. 140,690
Int. Cl.[3] A23C *9/12;* A23J *1/20;* C07G *7/00*
U.S. Cl. 426—35 10 Claims

1. A method of obtaining casein having a reduced cholesterol content from skim milk which method comprises the steps of:
(a) maintaining the skim milk at a pH of from about 6.0 to about 6.9;
(b) adding to the skim milk a pancreatic lipase having lipase activity and protease activity in an amount and of an activity sufficient to provide from 17 to 31 lipase units and 16 to 27 protease Northrop units per liter of skim milk and allowing the resultant mixture to incubate for a time sufficient to dissociate the casein from cholesterol contained therein;
(c) coagulating the casein by enzymatic means to cause the casein to phase separate and result in a solid casein phase being dispersed in a liquid, whey phase; and
(d) separating the solid, casein phase from the liquid, whey phase.

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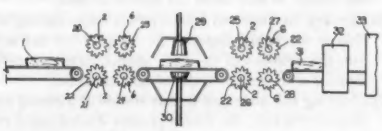
## 4,313,963
## METHOD FOR TENDERIZING CUT MEAT PORTIONS

Joseph Greenspan, Village of Evergreen Park, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Aug. 19, 1980, Ser. No. 179,464
Int. Cl.[3] A23B *4/02*
U.S. Cl. 426—58 20 Claims



1. A method for tenderizing cut portions of meat having upper and lower generally planar and parallel surfaces, comprising:
(1) slitting said portions by passing the portions into a plurality of rotating slitting blades having a plurality of discrete acute angle cutting surfaces on each slitting blade along the periphery thereof, wherein a series of closely spaced first cut slits extend from at least one surface into the said portions, and said slits have a length between ¼ inch and 1 inch and a width of between 0.02 and 0.05 inch;
(2) spraying the said at least one surface, either simultaneously with and/or immediately subsequent to said first slitting step, with a tenderizer solution containing a tenderizing phosphate, wherein the solution penetrates into and is retained in the said first slits;
(3) further slitting the portions, immediately subsequent to said spraying step, by passing the portions into a plurality

of rotating slitting blades having a plurality of discrete acute angle cutting surfaces on each slitting blade along the periphery thereof, wherein a series of closely spaced further cut slits extend from the at least one surface into said portions, and said slits have a length between ¼ inch and 1 inch and a width of between 0.02 and 0.05 inch, wherein the further slits are close to or in part overlap the said first cut slits and the said solution penetrates from or flows from the said first slits into the said further slits during said further slitting and subsequent thereto; and then

(4) immediately packaging and fast freezing the so processed portions;

wherein the total volume of the first slits is sufficient to retain therein from 5% to 16% of the said solution, and the number of first and further slits is sufficient that solution so penetrates or flows into the said further slits from the first slits prior to the freezing step such that the solution is essentially uniformly dispersed in the portions and the portions are essentially uniformly tenderized.

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**4,313,964**

## APPARATUS AND METHOD FOR PRODUCING EDIBLE FOOD FILLABLE CONES

**Stanley L. Dembecki, Phoenix, Ariz., assignor to Silver Cloud Enterprises, Inc., Phoenix, Ariz.**

**Continuation of Ser. No. 854,731, Nov. 25, 1977, abandoned. This application Sep. 13, 1979, Ser. No. 75,111**

**Int. Cl.³ A21D** *5/08*

**U.S. Cl. 426—138** **6 Claims**

1. A cone shaped edible container having an apex rounded in three dimensions for containing food substances, said container being produced by a process comprising the steps of:

(a) mixing a quantity of malleable dough;

(b) depositing a batch of the dough in a three dimensionally rounded apex of a cone shaped cavity, which cavity is defined by a male and female mold constructed of heat transmissive and impermeable material to shield the dough from direct contact with a source of heat and still subject the dough to heat from the source of heat;

(c) forcing the male and female molds into a mating relationship to forceably disperse the dough from the apex and into the confines of the cone shaped cavity to define the interior and exterior walls of said container;

(d) locking the male and female molds in a mated relationship to preclude the forces present during rapid cooking and curing of the dough from displacing the male and female molds from one another along the longitudinal axis of the cone shaped cavity;

(e) applying heat by conduction to the mated male and female molds from the source of heat to cook and cure the deposited dough rapidly and develop the container in no more than six (6) minutes by immersing the mated male and female molds in a cooking oil heated to a temperature in a range 350°–425° F.;

(f) relieving pressure build up within the cone shaped cavity resulting from the rapidly curing dough through a port located at the apex of the cone shaped cavity and commensurate with the point of deposition of the dough;

(g) removing the mated male and female molds from the cooking oil; and

(h) withdrawing said container from within the male and female molds.

**4,313,965**

## ICE CREAM CONE WITH JACKET ATTACHED AND METHOD THEREFOR

**David Weinstein, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.**

**Continuation-in-part of Ser. No. 885,278, Mar. 10, 1978. This application May 30, 1978, Ser. No. 910,886**

**Int. Cl.³ A21D** *15/00;* **B65B** *11/10*

**U.S. Cl. 426—139** **7 Claims**

1. The method of adhering a sanitary jacket to a conformally shaped ice cream cone comprising the steps of:

applying a dose of vapor consisting of a mixture of about 85% propylene glycol and about 15% water in a short duration burst to the interior of said jacket;

inserting an ice cream cone into said jacket into juxtaposition therewith while said vapor remains on the internal surface of said jacket; and

drying the combined cone and jacket.

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**4,313,966**

## COLORANTS FOR LIPID-BASED EDIBLE COMPOSITIONS AND LIPID-BASED COMPOSITIONS MADE THEREFROM

**Kenneth B. Basa, Evanston, and Robert G. Agusto, Chicago, both of Ill., assignors to National Can Corporation, Chicago, Ill.**

**Filed Dec. 11, 1978, Ser. No. 967,972**

**Int. Cl.³ A23L** *1/275;* **A23G** *1/00*

**U.S. Cl. 426—250** **5 Claims**

1. An edible, pigmented, brown, essentially water-free, lipid-based confectionary food composition consisting essentially of a lipid having a melting point of from about 89° F. to about 114° F. (31° C. to 46° C.) and a color blend composition comprising a finely divided caramel powder having a Hue Index of at least 3.9±0.10 and an approved food color lake color enhancer selected from the group consisting of from about 0.5 to 4.0% Yellow No. 6 lake, and of from about 0.1 to 10% Blue No. 2 lake or mixtures thereof uniformly dispersed throughout said lipid composition, said caramel powder being present in an amount of from about 1% to about 24% by weight of said lipid and said percentages of lakes being based on total colorant blend.

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**4,313,967**

## INTERMEDIATE-MOISTURE FROZEN FOODS

**Marvin L. Kahn, Williamsville, and Kuttikandathil E. Eapen, Kenmore, both of N.Y., assignors to Rich Products Corporation, Buffalo, N.Y.**

**Continuation-in-part of Ser. No. 24,129, Mar. 26, 1979, Pat. No. 4,220,671, and a continuation-in-part of Ser. No. 23,931, Mar. 26, 1979, Pat. No. 4,244,976, and a continuation-in-part of Ser. No. 23,974, Mar. 26, 1979, and a continuation-in-part of Ser. No. 24,130, Mar. 26, 1979, Pat. No. 4,237,146, and a continuation-in-part of Ser. No. 24,127, Mar. 26, 1979, Pat. No. 4,235,936, and a continuation-in-part of Ser. No. 24,128, Mar. 26, 1979, Pat. No. 4,234,611, and a continuation-in-part of Ser. No. 23,973, Mar. 26, 1979, Pat. No. 4,244,977, and a continuation-in-part of Ser. No. 21,937, Mar. 19, 1979, Pat. No. 4,248,902, and a continuation-in-part of Ser. No. 920,953, Jun. 30, 1978, Pat. No. 4,199,605, and a continuation-in-part of Ser. No. 917,379, Jun. 20, 1978, Pat. No. 4,199,604, said Ser. No. 24,129, and Ser. No. 23,931, and Ser. No. 23,974, and Ser. No. 24,130, and Ser. No. 24,127, and Ser. No. 24,128, and Ser. No. 23,973, and Ser. No. 21,937, each is a continuation-in-part of Ser. No. 917,379, Jun. 20, 1978, Pat. No. 4,199,604, and a continuation-in-part of Ser. No. 871,995, Jan. 24, 1978, Pat. No. 4,154,863, and a continuation-in-part of Ser. No. 763,613, Jan. 28, 1977, Pat. No. 4,146,652. This application Mar. 14, 1980, Ser. No. 125,516**

**Int. Cl.³ A23L** *3/38, 3/00*

**U.S. Cl. 426—327** **26 Claims**

1. A microbiologically stable food product containing fruit,

wherein the fruit is a fruit infused with solutes by a method comprising the step of bathing the fruit in a solutes containing bath, said solute replacing a portion of said fruit's water content, wherein said solute is selected from the group consisting of fructose, dextrose, propylene glycol, glycerine and polyhydric alcohols, to induce infusion of solutes from said bath into the fruit, and wherein said fruit is in a food which is a microbilogically stable food product having a water activity of from about 0.08 to about 0.93, which is substantially non-crystalline at freezer temperatures and is spoonable or flowable at freezer temperatures of about 10° F.

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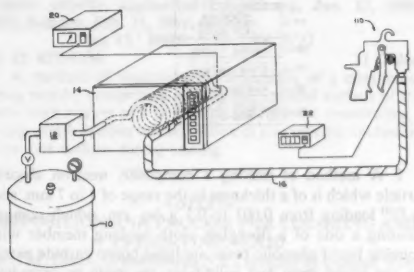
**4,313,968**

## APPLICATION OF LIQUID COATING MATERIAL

**James E. Sickles, Glenshaw, and Wen-Hsuan Chang, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Nov. 14, 1979, Ser. No. 94,008**
**Int. Cl.³ B05D 1/06**
**U.S. Cl. 427—27** **10 Claims**



1. In the method of applying a liquid coating composition to a workpiece wherein a coating composition is atomized into liquid particles, an electrical charge is imparted with an induction charging electrode means on said particles substantially simultaneously with their formation, and the charged particles are directed to an electrically-receptive workpiece, the improvement comprising heating said coating composition to adjust its conductivity and to enhance the induction charging of the particles formed from said heated coating composition.

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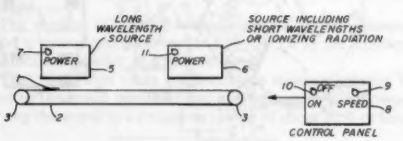
**4,313,969**

## METHOD AND APPARATUS FOR PROVIDING LOW GLOSS AND GLOSS CONTROLLED RADIATION-CURED COATINGS

**John C. Matthews, Columbia, and Robert W. Couch, Frederick, both of Md., assignors to Fusion Systems Corporation, Rockville, Md.**

**Filed Sep. 10, 1979, Ser. No. 73,630**
**Int. Cl.³ B05D 3/06**
**U.S. Cl. 427—44** **21 Claims**




1. A method of producing either a relatively low gloss or a gloss controlled radiation-cured coating, comprising the steps of,

providing a radiation curable coating of a composition which includes inert particulates,

irradiating said coating with curing radiation of wavelengths to which the coating is responsive but having substantially no distribution beneath about 300 nm, and,

subsequently irradiating said coating with curing radiation of wavelengths to which the coating is responsive including substantial radiation at wavelengths beneath 300 nm.

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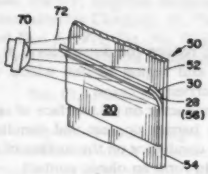
**4,313,970**

## METHOD OF MASKING A WORKPIECE FOR PAINTING

**Wallace R. Jones, Waite Hill Village; John F. Haas, Chagrin Falls; Paul A. Krieger, Bay Village, and David E. Frappier, Mayfield Height, all of Ohio, assignors to The Excello Speciality Company, Cleveland, Ohio**

**Filed Jul. 3, 1980, Ser. No. 165,616**
**Int. Cl.³ B05D 3/06**
**U.S. Cl. 427—56.1** **22 Claims**




1. A method for masking and painting a workpiece along some predetermined demarcation zone to accommodate spray painting of a workpiece first area, said method comprising the steps of:

providing a thin, flexible paint mask including a mask layer having opposed faces with one of said faces having an adhesive layer substantially covering the surface area thereof and with a thin liner removably covering said adhesive layer;

severing at least said liner in a manner forming a sever line therealong having the same longitudinal conformation as said demarcation zone and which divides said mask into at least two sections, one of said sections being adapted for association with said workpiece first area on one side of said demarcation zone and the other of said sections being adapted for association with a second workpiece area on the other side of said demarcation zone;

removing that portion of said liner associated with said mask other section for exposing a first portion of said adhesive layer;

placing said mask on said workpiece with said adhesive layer first portion adhesively engaging said workpiece second area while aligning said mask so that said sever line is substantially coextensive with said demarcation zone;

causing said mask one section to automatically lift away from said workpiece first area generally along said sever line and thereby expose said first area generally coextensive with said demarcation zone, said lifting being to such extent that said mask one section diverges outwardly of said workpiece first area from said demarcation zone at generally an acute angle;

directing a paint spray toward said workpiece first area from a direction generally normal thereto; and,

removing said mask from association with said workpiece.

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**4,313,971**

## METHOD OF FABRICATING A SCHOTTKY BARRIER CONTACT

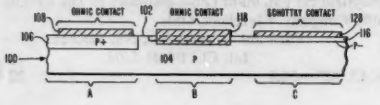
**Carl F. Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed May 29, 1979, Ser. No. 42,920**
**Int. Cl.³ H01L 21/225, 29/48**
**U.S. Cl. 427—84** **6 Claims**

1. A method of forming a Schottky barrier contact and an ohmic contact on a semiconductor wafer having a metal concentration of a conductivity type determining dopant which is too large to support the formation of the desired Schottky

barrier between said Schottky barrier contact and said semiconductor wafer, said method comprising the steps of:

exposing that region of said wafer where said Schottky barrier contact is to be formed to leaching ambient conditions which cause a reduction in the concentration of the conductivity determining dopant in said region for a time




sufficient to reduce the dopant level at and adjacent the surface of said region to one which will support said Schottky barrier;

disposing a conductor on said surface of said region to form a Schottky barrier contact and simultaneous therewith disposing a conductor on the surface of another region of said wafer to form an ohmic contact.

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**4,313,972**

## DRY METHOD FOR MAKING AN ELECTROCHEMICAL CELL ELECTRODE

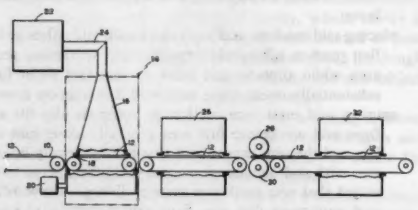
**Glen J. Goller, West Springfield, Mass., and Joseph R. Salonia, Middletown, Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Continuation-in-part of Ser. No. 920,036, Jun. 28, 1978, Pat. No. 4,287,232. This application Nov. 6, 1980, Ser. No. 204,729**

**The portion of the term of this patent subsequent to Sep. 1, 1998, has been disclaimed.**

**Int. Cl.³ H01M** *4/88, 4/04, 4/96*

**U.S. Cl. 427—113** **14 Claims**



1. A method for making an electrochemical cell electrode comprising the steps of:

applying a dry powder comprising carbon particles and hydrophobic polymer particles in a uniform layer on the surface of a porous electrode substrate with virtually no powder within the pores of the substrate by positioning the substrate within a chamber, dispersing said powder as a cloud in the chamber over said surface of said positioned substrate, and pulling the powder onto said surface by drawing a continuous vacuum under the substrate until the desired amount of powder has been deposited, wherein said substrate is graphitized carbon paper made from carbon fibers;

compacting the applied powder layer; and

sintering the compacted layer.

**4,313,973**

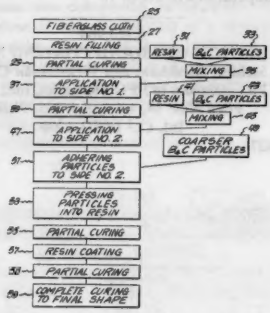
## METHOD FOR MANUFACTURE OF NEUTRON ABSORBING ARTICLE

**Carl H. McMurtry, Youngstown; Robert G. Naum, Lewiston, and Paul F. Forsyth, Niagara Falls, all of N.Y., assignors to Kennecott Corporation, Stamford, Conn.**

**Division of Ser. No. 870,237, Jan. 17, 1978, Pat. No. 4,218,622. This application Mar. 24, 1980, Ser. No. 133,157**

**Int. Cl.³ B05D** *1/28, 5/02, 5/00*

**U.S. Cl. 427—205** **16 Claims**




1. A method of making a composite, neutron absorbing article which is of a thickness in the range of 1 to 7 mm. and of a $B^{10}$ loading from 0.001 to 0.1 g./sq. cm. which comprises coating a side of a fiberglass cloth backing member with a curable liquid phenolic resin, applying boron carbide particles to the liquid resin and solidifying the resin to cross-linked permanently set form.

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**4,313,974**

## METHOD OF APPLYING ATOMIZED LIQUID PLASTICIZER TO A RUNNING TOW OF FILAMENTARY FILTER MATERIAL

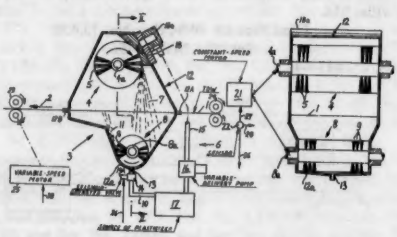
**Heinz Greve, Hamburg, and Günter Wahle, Reinbek, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany**

**Division of Ser. No. 25,040, Mar. 29, 1979, abandoned. This application Apr. 24, 1980, Ser. No. 143,184**

**Claims priority, application Fed. Rep. of Germany, Apr. 5, 1978, 2814881**

**Int. Cl.³ B05D** *1/02*

**U.S. Cl. 427—209** **6 Claims**



1. A method of applying droplets of liquid plasticizer to successive increments of a foraminous tow of filamentary filter material, comprising the steps of transporting the tow lengthwise along a predetermined path; establishing and maintaining a source of liquid plasticizer; conveying liquid plasticizer from said source solely to one side of said path; propelling droplets of the conveyed liquid plasticizer against successive increments of the running tow at said one side of said path whereby certain droplets adhere to the filamentary material and the

remaining droplets penetrate through the foraminous tow to the other side of said path; intercepting the remaining droplets at the other side of said path; propelling, exclusively, at least some of the intercepted remaining droplets against successive increments of the running tow at said other side of said path so that all droplets which are propelled against the running tow at said other side of said path consist only of plasticizer which has penetrated through the running tow from said one side of said path; and atomizing, in the course of said last named propelling step, the droplets which are propelled against the running tow at said other side of said path.

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4,313,975

## METHOD OF IMPROVING OPERATION OF CONTINUOUS CASTING NOZZLE

**Bernard Mairy, Sclayn-Andenne, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium**

**Filed Jan. 16, 1981, Ser. No. 225,711**

**Claims priority, application Luxembourg, Jan. 17, 1980, 82093; Belgium, Feb. 21, 1980, 881852**

**Int. Cl.³ B05D** *1/10, 5/08, 7/22*

**U.S. Cl. 427—236** **11 Claims**

1. A method of improving the operation of a continuous casting nozzle, comprising coating the internal surface of the nozzle with a layer of a finely divided material constituting a coating which inhibits the deposition of non-metallic inclusions on the said surface during casting.

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4,313,976

## COMPOSITION AND PROCESS FOR COLORING AND PRESERVING WOOD

**Robert M. Leach, Grand Island, N.Y., assignor to Osmose Wood Preserving Co. of America, Inc., Buffalo, N.Y.**

**Continuation-in-part of Ser. No. 73,518, Sep. 7, 1979, abandoned. This application Jun. 13, 1980, Ser. No. 159,196**

**Int. Cl.³ B05D** *1/18, 3/00;* **C09D** *5/16, 5/18*

**U.S. Cl. 427—297** **41 Claims**

1. A method for treating wood which simultaneously preserves the wood against wood destroying organisms and selectively colors the wood which comprises contacting the wood with an aqueous solution comprising: (a) a water soluble wood preservative containing any or all of the following heavy metals: copper, chromium, and zinc, and (b) one or more water soluble naphthalene derivatives having at least one sulfonyl group, at least one hydroxyl or amino group, and up to two additional groups selected from the group consisting of sulfonyl, hydroxyl and amino, wherein said groups are attached at any position around the naphthalene ring and the total number of said groups is not greater than 4.

4. The method of claim 1 or 3 wherein the final concentration of said preservative is between about 0.1% and 10.0% by weight.

5. The method of claim 4 wherein the final concentration of said naphthalene derivative is between about 0.01% and 2.0% by weight.

6. The method of claim 5 wherein the pH of the aqueous solution is maintained between about 0.5 to 3.0 by the addition of a sufficient quantity of a suitable acid.

39. The method of claim 6 wherein the aqueous solution is applied to the wood by a vacuum/pressure process, followed by drying the wood to a moisture content of about 20% or less.

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4,313,977

## REDUCED VOLATILITY OF A HALOGENATED PHENOL IN WOOD

**Robert L. Johnson, and Ralph M. Gooch, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Nov. 28, 1980, Ser. No. 210,952**

**Int. Cl.³ B05D** *1/18, 3/00, 3/04, 3/10*

**U.S. Cl. 427—342** **16 Claims**

1. A method for reducing the amount of halogenated phenol vapor released by wood treated with the halogenated phenol, said method comprising the step of contacting the halogenated phenol treated wood with an organic compound containing cationic groups capable of forming a water-insoluble organic salt of the halogenated phenol in situ, wherein the organic, salt-forming compound is of the type and employed in an amount sufficient to reduce the halogenated phenol vapor released by the wood.

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4,313,978

## ANTISTATIC COMPOSITIONS AND TREATMENT

**John Stevens; John S. Huizinga, both of Saint Paul, Minn., and Stephen Newman, Harlow, England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Dec. 3, 1979, Ser. No. 99,638**

**Claims priority, application United Kingdom, Dec. 20, 1978, 49359/78**

**Int. Cl.³ B05D** *3/02*

**U.S. Cl. 427—384** **30 Claims**

1. An antistatic composition comprising a mixture of (1) a fluorinated anionic surfactant, which surfactant is an amine salt of an acid containing a fluorinated organic radical, with (2) an antistatic agent, which agent is an ionic salt of an amine and an acid without a fluorinated organic radical wherein the anion molar % of the fluorinated organic radical is between 1.8% and 42.9% of the mixture.

15. A method of treating a surface to reduce the static charging thereon which comprises applying to said surface a mixture of (1) a fluorinated anionic surfactant which is an amine salt of an acid containing a fluorinated organic radical and (2) an antistatic agent which is an ionic salt of an amine and an acid without a fluorinated organic radical wherein the anion molar % of the fluorinated organic radical is between 1.8% and 42.9% of the mixture.

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4,313,979

## METHOD FOR IMPROVING ADHESION OF SILICONE RESIN COATING COMPOSITION

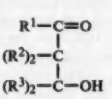
**Robert B. Frye, Albany, and James T. Conroy, Green Island, both of N.Y., assignors to General Electric Company, Waterford, N.Y.**

**Filed Sep. 25, 1980, Ser. No. 190,812**

**Int. Cl.³ B05D** *3/02*

**U.S. Cl. 427—387** **17 Claims**

1. A method for maintaining or rejuvenating initial adhesion to a thermoplastic acrylic-primed solid plastic substrate of an aqueous coating composition comprising a dispersion of colloidal silica in an aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$, wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing 10 to 50 weight percent solids, said solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, said composition also including a small, effective amount of a polysiloxane polyether copolymer and a small, effective amount of an ultraviolet screening agent, said method comprising adding a small effective amount of an aliphatic alcohol-water compatible liquid organic solvent for said partial condensate, said solvent also being capable of softening, but not dissolving said thermoplastic acrylic, said solvent being a $\beta$-hydroxy ketone having the structural formula:



wherein $R^1$ is a monovalent hydrocarbon radical of from 1 to

18 carbon atoms and $R^2$ and $R^3$ are, independently, a monovalent hydrocarbon radical of from 1 to 18 carbon atoms or hydrogen.

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**4,313,980**

## METHOD AND DEVICE FOR SLIDE HOPPER MULTILAYER COATING

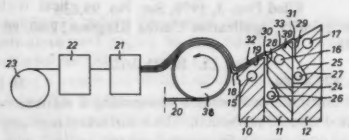
**Karel S. Willemsens, Berchem, Belgium, assignor to Agfa-Gevaert N.V., Mortsel, Belgium**

**Filed Apr. 16, 1980, Ser. No. 140,732**

**Claims priority, application United Kingdom, Apr. 19, 1979, 13627/79**

**Int. Cl.³ B05D *1/30***

**U.S. Cl. 427—402** **10 Claims**



**1.** A slide hopper multilayer web coating method comprising feeding liquid coating composition through each of at least two mutually parallel delivery slots formed in an inclined surface on which the quantities of composition emerging from the slots form downwardly moving layers which leave such inclined surface, superimposed one on another, at a transverse terminal edge thereof which is parallel with such slots, and pass onto a web moving generally perpendicularly to the width of said slots, wherein the width of the layer issuing from the top slot is greater than the width of at least one other layer and is not exceeded by the width of any other layer and the width of the web is at least as great as the width of the widest of the slots.

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**4,313,981**

## METHOD OF FORMING A ROLL PROTECTIVE LAYER

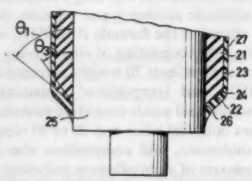
**Ryoichi Namiki, Hino, Japan, assignor to Ricoh Company, Ltd., Japan**

**Continuation of Ser. No. 46,621, Jun. 8, 1979, abandoned, which is a continuation of Ser. No. 844,060, Oct. 20, 1977, abandoned. This application Aug. 25, 1980, Ser. No. 180,929**

**Claims priority, application Japan, Oct. 27, 1976, 51/129152**

**Int. Cl.³ B05D *1/02***

**U.S. Cl. 427—409** **4 Claims**



**1.** A method of forming a protective layer on an offset preventing roller for use in an electrophotographic copying machine, the roller being of the type having a cylindrical core metal, for protection of the surface of the roller from an offset preventing liquid, comprising the steps of providing, on the cylindrical core metal, a roll surface layer to be protected of a silicone rubber having a uniform diameter intermediate portion of a selected thickness and end portions at each end tapered in the axial direction of the roll from the intermediate portion to the core metal and terminating inwardly of the respective ends of the cylindrical core metal, rotating the cylindrical core roller and surface layer and spraying an oil-resistant fluorine-containing silicone rubber coating over the surface layer while rotating the cylindrical core-roller to form a protective layer over the entire surface layer including said end portions and the cylindrical core metal beyond each end of said surface layer, and then applying room temperature vulcanized silicone rubber to the protective layer as an anti-offset layer.

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**4,313,982**

## ADJUSTING METHOD AND APPARATUS FOR A CYLINDRICAL ARTICLE PERIPHERAL SURFACE COATING MACHINE

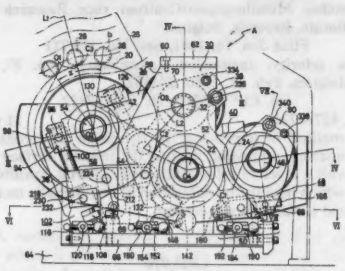
**Hideo Miura, Kawasaki, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan**

**Filed Dec. 26, 1979, Ser. No. 107,233**

**Claims priority, application Japan, Jan. 30, 1979, 54-8673**

**Int. Cl.³ B05D *1/28*; B05C *1/08***

**U.S. Cl. 427—428** **4 Claims**



**1.** An adjusting method for a cylindrical article peripheral surface coating machine of the type in which said cylindrical article peripheral surface coating machine includes a fountain means adapted to take up a coating solution, a transfer means in rolling contact with said fountain means through a receiving clearance adapted to receive the coating solution from said fountain means, and a coating means in rolling contact with said transfer means through a transfer clearance adapted to allow the coating solution to be transferred thereonto and also adapted to come into rolling contact through a coating clearance with the outer peripheral surface of a cylindrical article entering a coating zone while being conveyed on a separately travelling means to apply the coating solution to said outer peripheral surface, the adjusting method comprising adjusting and setting as desired said receiving clearance, said transfer clearance and said coating clearance each independently without affecting each other and, when a portion of said travelling means not carrying thereon the cylindrical article has approached said coating zone, subjecting said coating means, said transfer means and said fountain means to a collective displacement integrally to enlarge said coating clearance while leaving said transfer clearance and said receiving clearance intact without causing any change therein, said collective displacement of said coating means, transfer means and fountain means being a pivotal displacement on concentric arcs, and positioning and placing said transfer clearance on the opposite side to said travelling means and below a straight line which connects the center of said coating means with the center of said collective pivotal displacement for not contaminating said travelling means by the coating solution flying off from said transfer clearance, said collective pivotal displacement being effected with its pivotal center placed on a straight line meeting at right angles with a straight line which passes through the center of the coating zone of said travelling means and the center of said coating means.

**2.** An adjusting apparatus for a cylindrical article peripheral surface coating machine, comprising a first displacement control means connected to one end of a first bearing holder means the other end of which is pivoted idlably to a pivot shaft means, said pivot shaft means extending horizontally through a stand frame and being positioned on a straight line which

passes through the center of a coating roller shaft means and meeting at right angles with a straight line which passes through the center of a coating zone of a mandrel conveyor means and the center of said coating roller shaft means; a second displacement control means attached to one side of a second bearing holder means, said second displacement control means including a connecting screw rod means which is connected to said first bearing holder means; a third displacement control means connected to an eccentric sleeve means which bears therethrough a fountain roller shaft means in said second bearing holder means, said fountain roller shaft means carrying a fountain means secured to one end thereof; a transfer means secured to one end of a transfer roller shaft means which is journaled in and through said second bearing holder means, and which is positioned lower than said coating roller shaft means and said pivot shaft means whereby the transfer clearance is positioned lower than the straight line connecting the center of said coating roller shaft means with the center of said pivot shaft, said transfer means being adapted to come into rolling contact with said fountain means through a receiving clearance; a coating means secured to one end of said coating roller shaft means which is rotatably journaled in and through said first bearing holder means at a position close to the other end of the latter, said coating means being adapted to come into rolling contact with said transfer means through said transfer clearance and also adapted to come into rolling contact through a coating clearance with the outer peripheral surface of a cylindrical article fitted over a mandrel entering a coating zone while being conveyed on a separately travelling mandrel conveyor means; and a fourth displacement control means capable of displacing said first and second bearing holders means simultaneously and collectively.

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**4,313,983**

## PROCESS FOR DEPOSITING LATEX FILMS ON METAL SURFACES

**Mouhanad Chaker, 23 Moore Ct., Burlington, Vt. 05401**

**Continuation-in-part of Ser. No. 36,109, May 4, 1979, abandoned. This application Aug. 4, 1980, Ser. No. 175,302**

**Int. Cl.³ B05D *1/18***

**U.S. Cl. 427—435** **6 Claims**

1. An autodeposition process for coating a metallic surface which comprises preparing an aqueous solution substantially free of dissolved inorganic electrolyte, containing 2 to 30% by weight of cationically stabilized latex particles substantially free of hydrogen peroxide, adding to said aqueous solution about $10\times10^{-3}$ to $300\times10^{-3}$ mol per liter of hydrogen peroxide and about $10\times10^{-3}$ to $300\times10^{-3}$ mol per liter of an organic acid which is capable of forming charged metal complexes from metal ions, contacting said metallic surfaces with the said solution until a latex coating of a predetermined thickness has formed thereon.

**4,313,984**

## LAMINATED IDENTITY CARD HAVING SEPARATION-RESISTANT LAMINAE AND METHOD OF MANUFACTURING SAME

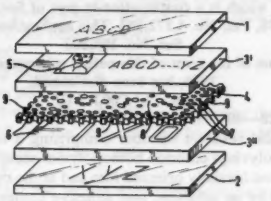
**Roland Moraw, and Renate Schädlich, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Dec. 19, 1979, Ser. No. 105,258**

**Claims priority, application Fed. Rep. of Germany, Dec. 30, 1978, 2856833**

**Int. Cl.³ B32B *3/24, 27/06***

**U.S. Cl. 428—13** **13 Claims**




1. An identity card comprising at least one outer transparent thermoplastic cover layer formed of thermoplastic polymeric material laminated to a thermoplastic polymeric material core; said card carrying at suitable points information serving to identity the cardholder and security markings for protecting against forgeries; said core further comprising a perforated reinforcing support layer which is dimensionally stable under the conditions used to laminate the thermoplastic polymeric material and permeable to the thermoplastic polymer of the core, wherein marginal areas of the support layer are more heavily perforated than a central area of the support layer.

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**4,313,985**

## PLASTIC AUTO PART AND ITS MANUFACTURING PROCESS

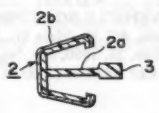
**Kozi Narita, Nagoya, Japan, assignor to Inoue Gomu Kogyo Kabushika Kaisha, Aichi, Japan**

**Continuation-in-part of Ser. No. 967,630, Dec. 8, 1978, abandoned. This application Nov. 14, 1980, Ser. No. 207,202**

**Claims priority, application Japan, Dec. 4, 1978, 53-166947**

**Int. Cl.³ B60R *13/00***

**U.S. Cl. 428—31** **8 Claims**




1. An automobile trim strip for attachment to a portion of an automobile formed from a rigid resin having a modulus of elasticity greater than 7,000 kg/cm² at 23° C., selected from the group consisting essentially of acrylonitrile-butadiene-styrene resin, acrylonitrile-styrene resin, polypropylene, polyphenylene oxide or polyvinyl chloride having up to 10% by weight of a plasticizer therein or a glass fiber reinforced resin thereof, said trim strip comprising a substrate having a welding portion means for ultrasonic weld attachment to said portion of an automobile, said welding portion means extending from said substrate, and a U-shaped metal foil layer covering a portion of said substrate wherein said welding portion means is positioned between the planes defined by the legs of the U of the U-shaped metal foil layer and said welding portion means does not contact said metal foil layer, and wherein said substrate and said welding portion means are formed from a rigid resin, having a modulus of elasticity greater than 7,000 kg/cm² at 23°

C., selected from the group consisting essentially of acrylonitrile-butadiene-styrene resin, acrylonitrile-styrene resin, polypropylene, polyphenylene oxide, or PVC having up to 10% by weight of a plasticizer therein or a glass fiber reinforced resin thereof.

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**4,313,986**

## CHEMICALLY-RESISTANT ADHESIVES AND LABELS

**Frank A. Magnotta, Framingham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.**

**Continuation-in-part of Ser. No. 9,033, Feb. 5, 1979, Pat. No. 4,217,263, which is a continuation-in-part of Ser. No. 912,819, Jun. 5, 1978, Pat. No. 4,172,163. This application Dec. 7, 1979, Ser. No. 100,303**

**The portion of the term of this patent subsequent to Oct. 23, 1996, has been disclaimed.**

**Int. Cl.³ C09J *7/02***

**U.S. Cl. 428—40** **26 Claims**

1. An acid resistant member comprising a non-plasticized film of a polyvinyl chloride homopolymer secured at one side to a balanced biaxially oriented film and at the opposite side to a substrate by an adhesive, said adhesive comprising a binder selected from the class consisting of styrene isoprene copolymers and polyisobutylene elastomers having a Mooney viscosity index between about 35 and 55, a non-hydrolyzable resin tackifier, a non-hydrolyzable resin plasticizer, and a stabilizer, said binder and tackifier being present in a weight ratio in the range from about 1:1 to about 1:1.5, said tackifier and plasticizer being present in a weight ratio in the range from about 6:1 to about 15:1, and said stabilizer being present in a concentration in the range from about 0.5% to about 3% by weight of the binder and tackifier combined.

17. An adhesive composition comprising a binder selected from the class consisting of styrene isoprene copolymers and polyisobutylene elastomers, having a Mooney viscosity index in the range from about 35 to about 55, a non-hydrolyzable resin tackifier, a non-hydrolyzable resin plasticizer, and a stabilizer, said binder and tackifier being present in a weight ratio in the range from about 1:1 to about 1:1.5, said tackifier and plasticizer being present in a weight ratio in the range from about 6:1 to about 15:1, and said stabilizer being present in a concentration of about 0.5% to about 3% by weight of the binder and tackifier combined.

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**4,313,987**

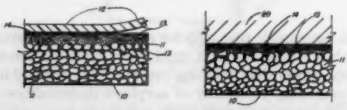
## POLYSTYRENE VEHICLE BODY PROTECTOR SYSTEM

**James L. McCormick, 467 W. Main St., Madison, Ohio 44057**

**Filed Feb. 28, 1980, Ser. No. 125,742**

**Int. Cl.³ B32B *3/12, 3/26, 31/00***

**U.S. Cl. 428—40** **25 Claims**



17. A foam panel vehicle body protector system comprising:

a. a series of polystyrene foam panels each sculptured to fit various areas of the exterior surface;

b. adhesive backing means formed on at least a portion of said interior surface for adhering each of said foam panels to preselected exposed portions of the vehicle body;

c. a protective layer secured temporarily to the adhesive means of the aid polystyrene panels which can be easily removed so that the panel may be secured to the exterior surface of a vehicle.

**4,313,988**

## EPOXYPOLYSILOXANE RELEASE COATINGS FOR ADHESIVE MATERIALS

**Robert J. Koshar, Mahtomedi, and Stephen W. Bany, St. Paul, both of MN, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation-in-part of Ser. No. 124,634, Feb. 25, 1980. This application Dec. 15, 1980, Ser. No. 216,684**

**Int. Cl.³ C09J *7/04, 7/02;* B32B *7/06***

**U.S. Cl. 428—40** **24 Claims**

1. A composite structure comprising a pressure-sensitive adhesive tape in which a backing is provided on one surface with a layer of normally tacky and pressure-sensitive adhesive and on the other surface with a low adhesion backsize which is the crosslinked, polymeric network reaction product of starting materials comprising

(1) a curable epoxypolysiloxane, in solution or in the form of 100% solids, which is represented by the formula,

wherein

R is a lower alkyl group or radical of one to three carbon atoms,

$R^1$ is a monovalent hydrocarbon radical of 4 to 20 carbon atoms,

E is a monovalent epoxy-containing hydrocarbon radical,

M is a silyl group $R_3Si$—, $R_2R^1Si$— or $R_2ESi$—, where R, $R^1$, and E are defined above,

a is 5 to 200,

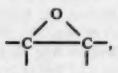
b is 0 or up to 20% of a,

a+b is 5 to 200,

c may be 0 when M is $R_2ESi$— or is greater than 0 but less than 20% of the value of (a+b) when M is $R_3Si$—, $R_2R^1Si$— or $R_2ESi$—, and

n is 1 to 75;

provided that the monovalent epoxy-containing hydrocarbon radical, E, contains at least one polymerizable epoxy group,



the remainder being composed of carbon and hydrogen free of acetylenic unsaturation and in addition to the oxirane oxygen can contain ether, —O—, or carbonyl oxygen,

(2) 0 to about 98% by weight of the epoxypolysiloxane described in (1) of an epoxy-terminated silane, which silane is represented by the formula,

wherein E is an epoxy-containing monovalent hydrocarbon radical defined above, p is 1 to 3 and $R^2$ can be an aliphatic hydrocarbon radical of less than 10 carbon atoms;

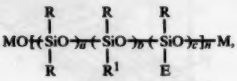
and said materials are cured in the presence of a catalytically effective amount of an epoxy curing catalyst.

17. A method of making a low adhesion backsize coating for a pressure sensitive adhesive tape, said coating affording accurately predictable and controllable release for a wide variety of

normally tacky and sensitive adhesives, which method includes the steps of:

a. blending together in a mutually compatible solvent system, to form a solution, components comprising

(1) a curable epoxypolysiloxane which is represented by the formula,



wherein

R is a lower alkyl group or radical of one to three carbon atoms,

$R^1$ is a monovalent hydrocarbon radical of 4 to 20 carbon atoms,

E is a monovalent epoxy-containing hydrocarbon radical,

M is a silyl group $R_3Si$—, $R_2R^1Si$—, or $R_2ESi$—, where R, $R^1$, and E are defined above,

a is 5 to 200,

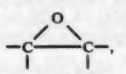
b is 0 or up to 20% of a,

a+b is 5 to 200,

c may be 0 when M is $R_2ESi$— or is greater than 0 but lesser than 20% of the value of (a+b) when M is $R_3Si$—, $R_2R^1Si$— or $R_2ESi$—, and

n is 1 to 75;

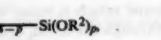
provided that the monovalent epoxy-containing hydrocarbon radical, E, contains at least one polymerizable epoxy group,



the remainder being composed of carbon and hydrogen free of acetylenic unsaturated and in addition to the oxirane oxygen can contain ether, —O—, or carbonyl oxygen,

and

(2) 0 to about 98% by weight of the epoxypolysiloxane described in (1) of an epoxy-terminated silane wherein said epoxy-terminated silane is represented by the formula,



wherein E is an epoxy-containing monovalent hydrocarbon radical defined above, p is 1 to 3 and $R^2$ can be an aliphatic hydrocarbon radical of less than 10 carbon atoms,

b. admixing an effective amount of an epoxy curing catalyst,

c. coating the pourable liquid to form a thin film upon a substrate, and

d. heating or irradiating to effect reacting and curing of (1) and (2).

**22**. A release liner in which a backing is provided on at least one surface with a thin release layer which is the crosslinked, polymeric network reaction product of starting materials comprising

(1) a curable epoxypolysiloxane, in solution or in the form of 100% solids, which is represented by the formula,

wherein

R is a lower alkyl group or radical of one to three carbon atoms,

$R^1$ is a monovalent hydrocarbon radical of 4 to 20 carbon atoms,

E is a monovalent epoxy-containing hydrocarbon radical,

M is a silyl group $R_3Si$—, $R_2R^1Si$—, or $R_2ESi$—, where R, $R^1$, and E are defined above,

a is 5 to 200,

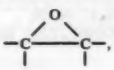
b is 0 or up to 20% of a

a+b is 5 to 200,

c may be 0 when M is $R_2ESi$— or is greater than 0 but less than 20% of the value of (a+b) when M is $R_3Si$—, $R_2R^1Si$— or $R_2ESi$—, and

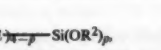
n is 1 to 75;

provided that the monovalent epoxy-containing hydrocarbon radical, E, contains at least one polymerizable epoxy group,



the remainder being composed of carbon and hydrogen free of acetylenic unsaturation and in addition to the oxirane oxygen can contain ether, —O—, or carbonyl oxygen,

(2) 0 to about 98% by weight of the epoxypolysiloxane described in (1) of an epoxy-terminated silane wherein said epoxy-terminated silane is represented by the formula,



wherein E is an epoxy-containing monovalent hydrocarbon radical defined above, p is 1 to 3 and $R^2$ can be an aliphatic hydrocarbon radical of less than 10 carbon atoms;

cured in the presence of a catalytically effective amount of an epoxy curing catalyst.

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**4,313,989**

## MAGNETIC RECORDING MEDIUM

**Yoshihisa Suzuki; Takanoli Kaizuka; Yoshiaki Hanyu; Mitsuyoshi Otake, and Yoichi Hidano, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 5, 1980, Ser. No. 118,742**

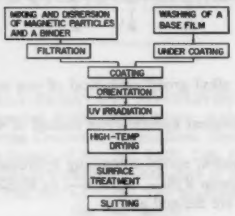
**Claims priority, application Japan, Feb. 9, 1979, 54-13349**

**Int. Cl.**[3] **B32B** *3/02*

**U.S. Cl. 428—64** **9 Claims**

**1**. A magnetic recording medium comprising a support, a magnetic layer containing magnetic particles bonded by a polyurethane binder and being adhered to the support, and a metamorphosed layer, formed by irradiating the magnetic

layer with ultraviolet rays, which is derived from some of said polyruethane binder and is formed on the surface of the magnetic layer, whereby stickness of said medium is substantially prevented.

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**4,313,990**

## PILE WEATHERSTRIP

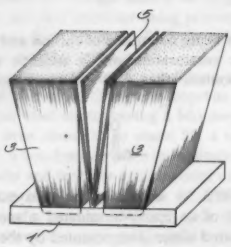
**Timothy W. Franklin, Luton, England, and Paul G. Declercq, Kortrijk, Belgium, assignors to Schlegel (UK) Limited, Leeds, England**

**Filed Oct. 2, 1980, Ser. No. 193,121**

**Claims priority, application United Kingdom, Oct. 8, 1979, 34795/79; May 30, 1980, 17736/80**

**Int. Cl.**[3] **D04H** *11/00;* **E06B** *7/22*

**U.S. Cl. 428—85** **6 Claims**



1. Pile weatherstripping comprising a backing strip, pile material projecting from one of the surfaces of said backing strip and including at least two V-shaped fins associated with said pile material, said at least two V-shaped fins extending away from said backing strip in the same direction as said pile material.

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**4,313,991**

## SEAM-COVERING DEVICE

**Thomas R. Lamb, 3 Dennison Ave., Freeport, Me. 04032**

**Filed Mar. 31, 1980, Ser. No. 136,170**

**Int. Cl.**[3] **B32B** *3/02, 3/10*

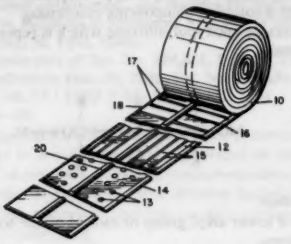
**U.S. Cl. 428—131** **7 Claims**

1. An improved plasterboard seam taping member for use at junctions between adjoining pieces of plasterboard where the plasterboard edges are slightly tapered comprising:

a body strip formed of planar plastic material having a front face, a rear face, and parallel side edges which have a taper toward said rear face;

adhesive means affixed to the rear of said body strip material to adhere said body strip to said plasterboard over the seams formed therebetween; and

a narrow projection approximately ¼ inch in height in the form of a bead having a top extending longitudinally parallel to said side edges upon the central portion of the front face of said strip, the top of said projection, when said body strip is adhered to the slightly tapered plasterboard edges at a junction between two sheets of plasterboard, being higher than said body strip elevating the trowel applying plaster to the joint and causing a feathering of the plaster outward from said projection to beyond the side edges of said body strip.

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**4,313,992**

## CENTRIFUGE SCREEN

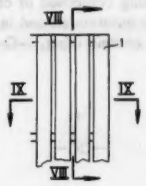
**Leonhard Spiewok, Wallisellen, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland**

**Continuation of Ser. No. 922,550, Jul. 7, 1978, abandoned. This application May 14, 1979, Ser. No. 38,866**

**Claims priority, application Switzerland, Jul. 22, 1977, 9104/77**

**Int. Cl.**[3] **B04B** *7/16;* **B32B** *3/24*

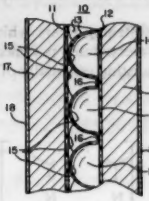
**U.S. Cl. 428—136** **6 Claims**




1. A screen for the drum of a centrifuge comprising a supporting frame, and a plurality of transversely spaced screen bars which are oriented to extend axially of the drum for which the screen is intended, are made of a hard material, and serve to support material which is being centrifuged as the material moves axially through the drum, and characterized in that the frame is a perforated plate so constructed that it supports each bar over the entire length of the bar; and in that each bar is connected to the frame by an adhesive joint which also extends over the entire length of the bar.

3. A screen for the drum of a centrifuge comprising a supporting frame, and a plurality of transversely spaced screen bars which are oriented to extend axially of the drum for which the screen is intended, are made of a hard material, and serve to support material which is being centrifuged as the material moves axially through the drum, and characterized in that the frame is a grid having members which extend transversely of said screen bars and grating bars which extend axially of the screen bars and on which the screen bars rest, whereby the frame supports each bar over the entire length of the bar; and in that each bar is connected to the frame by an adhesive joint which also extends over the entire length of the bar.

4,313,993
**LAMINATED INSULATION**
Joseph J. McGlory, 13 Kathryn Rd., Chalfont, Pa. 18914
Filed Apr. 14, 1980, Ser. No. 140,005
Int. Cl.³ B32B *3/00, 3/28, 5/32*
U.S. Cl. 428—178 7 Claims



1. A laminated thermal insulation comprising
a central impervious thermal insulating and reflecting layer comprising a synthetic plastic sheet formed and shaped to provide rows of air bubbles secured to at least one planar synthetic plastic sheet so as to enclose said air bubbles,
panels on each side of said central layer of porous thermal insulating materials which permit air circulation therethrough,
said panels being selected from the group consisting of glass fibers and foamed synthetic plastic, and
an outer cover in engagement with the outer faces of said panels.

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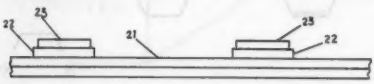
4,313,994
**HEAT TRANSFER LABELING**
Katherine A. Kingston, Belmont, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.
Filed Oct. 24, 1979, Ser. No. 87,912
Int. Cl.³ B41M *3/12, 5/26*
U.S. Cl. 428—200 11 Claims



1. A label for heat transfer labeling comprising a carrier;
an imprinted, discontinuous, thermoplastic and resinous release layer on said carrier, said layer containing a repellent thermoplastic silicone material therein; and
a transfer layer, including a design superimposed upon continuous portions of said release layer which is discontinuous elsewhere;
said release layer having continuous portions, each with a border in conformity with the design of the transfer layer superimposed thereon;
said release layer being carried with said transfer layer during the heat transfer step.

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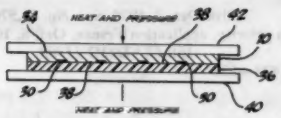
4,313,995
**CIRCUIT BOARD AND METHOD FOR PRODUCING SAME**
Joseph A. Delgadillo, Granada Hills, Calif., assignor to Fortin Laminating Corporation, San Fernando, Calif.
Division of Ser. No. 739,608, Nov. 8, 1976, Pat. No. 4,091,125. This application Apr. 20, 1977, Ser. No. 789,194
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—201 4 Claims

1. A circuit board assembly comprising;
a sheet of electrically conductive metal having a portion of the surface thereof containing a selectively roughened pattern in the configuration of a pre-determined electrically conductive circuit, said selectively roughened pattern being honed such that no metal is added to and substantially no metal is taken away from said surface of said sheet; and
a resin coated substrate bonded to said sheet of electrically conductive metal by the application of heat and pressure to the assembly, said resin coated substrate being essentially directly adherent to the roughened patterned portion of the surface of said sheet of electrically conductive metal and substantially nonadherent to the non-roughened portion of the surface of said sheet of electrically conductive metal whereby the non-roughened portion of the surface of said sheet of electrically conductive metal may be cut and removed from said resin coated substrate.



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4,313,996
**FORMABLE METAL-PLASTIC-METAL STRUCTURAL LAMINATES**
Ritchey O. Newman; James K. Rieke, and Donald R. Wright, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed May 21, 1979, Ser. No. 41,441
Int. Cl.³ B32B *7/02, 15/08;* B29C *19/00*
U.S. Cl. 428—215 18 Claims

1. A metal-polymer-metal structural laminate comprising a core of polymeric resinous material having tightly adhered to each side thereof a metal skin layer wherein each metal skin layer is from about 2 to about 20 mils thick, said laminate further having a ratio of core thickness to skin thickness of less than 9:1, and a total thickness of from about 5 to about 65 mils; the materials of construction of said polymeric core and metal skins and the geometry of the laminate being such that the laminate has a flexural stiffness at least 40% that of the solid metal of the same thickness as measured by ASTM D790 on a one inch wide sample having four inch span under three point loading conditions, a density from about 25% to 90% that of the average of two solid metal skin layers, a limiting dome height of at least about 60 percent of the limiting dome height of the solid metal of the skin layer of the lower ultimate elongation having the same thickness, the capability of being subjected to a no load oven test, subsequent to forming of said laminate, at a temperature of at least 190° F. for a period of 30 minutes without delaminating, and the capability of being bent at room temperature to 90° to a critical radius without metal rupture, the critical radius defined as the distance from the pivot point to the inner skin surface of the laminate, being about equal to the total laminate thickness.

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4,313,997
**PERLITE BOARDS AND METHOD FOR MAKING SAME**
David L. Ruff, Torrance, and Narikottile G. Nath, Carson, both of Calif., assignors to Grefco, Inc., Bala Cynwyd, Pa.
Filed Jul. 14, 1980, Ser. No. 168,483
Int. Cl.³ B32B *5/16, 11/02, 19/02*
U.S. Cl. 428—220 14 Claims

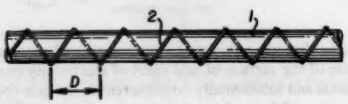
1. A perlite board having a thickness greater than about 1 inch said perlite board comprising particles of expanded perlite and a binder having the property of permanent tackiness in the dry state.

4,313,998

## TEXTILE ELEMENT AND WOVEN MATERIAL INTENDED IN PARTICULAR TO SERVE AS SUBSTRATE FOR A CATALYTIC MATERIAL, FOR INSTANCE A COMBUSTION CATALYTIC MATERIAL

Jean-Claude Pivot, Vourles, and Jean Aucagne, La Tour Du Pin, both of France, assignors to Application Des Gaz, Paris, France

Filed Oct. 3, 1979, Ser. No. 81,570
Claims priority, application France, Oct. 6, 1978, 78 29197
Int. Cl.³ D03D 13/00
U.S. Cl. 428—222 15 Claims




1. A catalyst assembly, comprising a substrate for the support of a catalytically active substance, said substrate comprising at least one complex filiform textile element comprised of fibers of an inorganic material wherein said fibers of an inorganic material extend in substantially the same direction as the complex filiform textile element, said fibers of the textile element being contained on the outside by an enveloping but open structure of metal, the total area of the openings of said open structure (So) being greater than the total area of the enveloping surface (Se) of said open structure covering the apparent peripheral surface of all of the fibers.

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4,313,999

## LAMINATE COMPOSITION COMPRISING POLYETHERIMIDE IMPREGNATED FABRIC

Raymond B. Hughes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 16, 1980, Ser. No. 187,769
Int. Cl.³ B32B 7/00
U.S. Cl. 428—251 12 Claims

1. In a laminate composition comprising a ply of fabric material impregnated with a solid resin binder, the improvement wherein said resin binder comprises polyetherimide reaction product of aromatic bis(etheranhydride) with organic diamine, said reaction product being cross-linked with tri-functional isocyanate agent.

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4,314,000

## FIBER LUBRICANTS YIELDING LOW RESIDUES UPON OXIDATION

Basil Thir, Grosse Ile, Mich.; David D. Newkirk, Beaverton, Oreg.; Stephen E. Eisenstein, Oak Park, and William K. Langdon, Grosse Ile, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 3, 1980, Ser. No. 203,434
Int. Cl.³ C07C 43/30, 43/32; B05D 3/02; B32B 7/00
U.S. Cl. 428—265 23 Claims

15. A nylon or polyester fiber coated with a fiber lubricant comprising a condensation product of formaldehyde and an alkylene glycol, an alkylene oxide adduct thereof, and mixtures thereof, in which the alkylene radicals contain from 2 to 3 carbon atoms, said condensation product being present in an amount of from 0.05 weight percent to 5 weight percent based on the weight of lubricated fiber and such lubricant showing a volatility at a temperature of approximately 230° C. below 10 weight percent loss based on the weight of fiber lubricant and yielding a level of residue of less than two weight percent based on the weight of the fiber lubricant upon oxidation at the heater plate temperature.

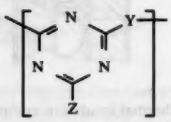
4,314,001

## NOVEL POLYMERIC COMPOUNDS, PROCESSES AND METHODS OF USE

Eugene P. Wesseler, Sharonville, Ohio, assignor to Sterling Drug Inc., New York, N.Y.

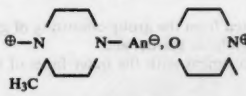
Filed Mar. 3, 1980, Ser. No. 126,995
Int. Cl.³ D06M 15/12; C08L 79/04; C08G 73/06; D21H 3/48
U.S. Cl. 428—393 5 Claims

1. A method of softening fibers which comprises treating said fibers with a water-soluble polymeric quaternary ammonium compound consisting essentially of repeating units of the formula



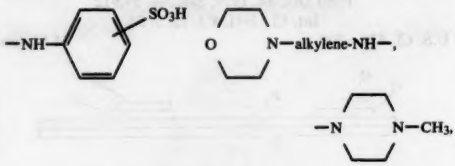

wherein:

Y represents a moiety selected from the group consisting of —N⊕$(CH_3)_2$—alkylene-NR- An⊖,




and —N⊕$(CH_3)_2$-alkylene-N⊕$(CH_3)_2$-2An⊖;

Z represents a moiety selected from the group consisting of —N($R^1$)-alkylene[1]-N($R^2$)$_2$, —N⊕$(CH_3)_2R^3$ An⊖,




—NH-alkylene[1]-N$R^4$-alkylene[1]-$NH_2$ in which alkylene and alkylene[1] are each selected from the group consisting of —$CH_2CH_2$—, —$CH_2CH_2CH_2$—and —$CH_2CH_2CH_2CH_2$—; R, $R^1$, $R^2$ and $R^4$ are each selected from the group consisting of hydrogen and non-tertiary $C_1$ to $C_4$ alkyl; $R^3$ is a non-tertiary $C_1$ to $C_{18}$ alkyl; and An⊖ is a monovalent anion.

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4,314,002

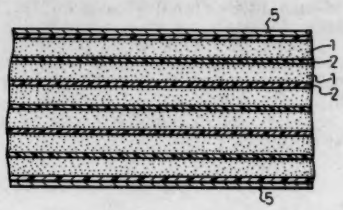
## INSULATING LAMINATES COMPRISING ALTERNATING FIBER REINFORCED RESIN LAYERS AND UNREINFORCED RESIN LAYERS

Masayuki Oizumi, Kobe; Masana Goto, Miki; Minoru Ishiki, and Shoji Uozumi, both of Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 29, 1980, Ser. No. 116,599
Claims priority, application Japan, Feb. 2, 1979, 54-11780
Int. Cl.³ B32B 15/08, 15/12, 15/14, 15/20, 23/08
U.S. Cl. 428—414 22 Claims

1. Insulating laminate for electric use consisting essentially of a plurality of cellulosic reinforced layers each fully impregnated with a thermoset resin, and unreinforced layers of a cured resin existing between and extending substantially over

the surface of the reinforced layers, wherein said layers of cured resin are substantially integral with the adjacent reinforcements, which are isolated from each other by said layers of cured resin.

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## 4,314,003

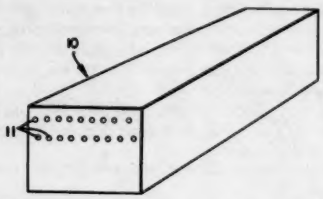
## METHOD OF INCORPORATING MULTIFILAMENT STRANDS OF CARBON FIBERS INTO CEMENT TO PRODUCE REINFORCED STRUCTURES HAVING IMPROVED FLEXURAL STRENGTHS

**Richard D. Curnow, and Christopher G. Cowie, both of Bristol, England, assignors to Union Carbide Corporation, New York, N.Y.**

**Division of Ser. No. 100,456, Dec. 5, 1979, which is a continuation of Ser. No. 865,627, Dec. 29, 1977, abandoned. This application Apr. 25, 1980, Ser. No. 143,633**

**Int. Cl.³ D04H** *3/02, 3/08;* **B32B** *9/00, 13/02*

**U.S. Cl. 428—294** **8 Claims**




1. A reinforced cementitious structure having improved flexural strength comprising a cementitious matrix containing discrete cement particles reinforced with multifilament strands of carbon fibers characterized in that said carbon fibers are bonded to each other and to said cement particles surrounding said carbon fibers by a hydrophobic resin system which has been incorporated into said carbon fibers by impregnation and which has been cured simultaneously with said cementitious matrix.

5. A reinforced cementitious structure as in claim 1 wherein the strands of carbon fibers are arranged in parallel rows.

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## 4,314,004

## FLUOROCARBON RESIN COATED SUBSTRATES AND METHODS OF MAKING

**Richard L. Stoneberg, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jun. 26, 1980, Ser. No. 163,353**

**Int. Cl.³ B32B** *11/04*

**U.S. Cl. 428—421** **16 Claims**

1. A method of providing a durable coated substrate, comprising the steps of:

(a) applying a pigmented coating composition to a substrate, said composition consisting essentially of from about 45% to about 85% of a fluorocarbon resin and from 15% to about 55% of a thermoplastic acrylic resin, on a resin solids basis, and having a PVC of from about 3% to about 55%, on a dry film basis; and

(b) applying a clear coating composition to the coated substrate of step (a), said composition consisting essentially of from about 45% to about 85% of a fluorocarbon resin, and from about 15% to about 55% of a thermoplastic acrylic resin, on a resin solids basis; and

(c) baking the coated substrate of step (b) to cause the coatings to fuse together intimately in a bonding process to provide good intercoat adhesion and craze-resistance, thereby forming the coated substrate.

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## 4,314,005

## PROCESS FOR COATING FERROUS METAL ARTICLES AND RESULTING ARTICLES

**Jose V. Arias, Apartado 51950 1050A, Caracas, Venezuela**

**Filed Jun. 12, 1980, Ser. No. 158,757**

**Int. Cl.³ B32B** *15/04*

**U.S. Cl. 428—467** **7 Claims**

1. A process for thermo-chemically coating ferrous metal articles, comprising:

(1) forming a uniform composition consisting essentially of:

(a) 450 grams±10% of magnesium oxide
(b) 170 grams±10% of zinc oxide
(c) 80 grams±10% of lead dioxide
(d) 80 grams±10% of lead pentoxide
(e) 170 grams±10% of chromium oxide
(f) 200 grams±10% of aluminum oxide
(g) 240 grams±10% of manganese oxide
(h) 250 grams±10% of cobalt oxide
(i) 200 grams±10% of vanadium oxide
(j) 309 grams±10% of copper oxide
(k) 250 grams±10% of powdered lithium
(l) 185 grams±10% of sodium hyposulphite
(m) 3 liters±10% of neatsfoot oil
(n) 5 liters±10% of African palm oil
(o) 9.5 liters±10% of heavy transmission oil of 160 to 170 density
(p) 3 liters±10% of creosote;

(2) pre-heating a ferrous article to be treated to a temperature of about 678° C. in an oven with an oxidizing flame;

(3) immersing the pre-heated ferrous article in, or otherwise contacting the surfaces of the pre-heated ferrous article with, the composition formed in step (1) for a minimum of 30 seconds; and

(4) removing the ferrous article from contact with the composition formed in step (1) and allowing the article to cool.

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## 4,314,006

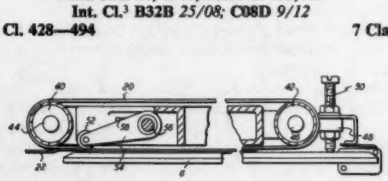
## FLEXIBLE DOCUMENT TRANSPORT BELT OF ETHYLENE PROPYLENE DIENE RUBBER

**James A. Lentz, Penfield, and Joseph H. Moriconi, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jun. 26, 1980, Ser. No. 163,443**

**Int. Cl.³ B32B** *25/08;* **C08D** *9/12*

**U.S. Cl. 428—494** **7 Claims**




1. In a document handling apparatus, for moving documents into and out of copying position on the platen of a document copying machine, having a flexible document transport belt therein, the improvement which consists essentially of making said belt from an ethylene propylene diene rubber having a relatively stable coefficient of friction and having a relatively high resistance to attacks by environmental elements.

## 4,314,007
## COMPOSITE SHAPED ARTICLES

Gernot Gessinger, Birmenstorf, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Division of Ser. No. 826,987, Aug. 23, 1977, abandoned. This application Aug. 6, 1979, Ser. No. 63,818

Claims priority, application Switzerland, Aug. 26, 1976, 10828/76

Int. Cl.³ B32B *15/02;* F01D *5/14*

U.S. Cl. 428—614 22 Claims

1. A turbine blade which comprises a plurality of reinforcing cores of a heat resistant, oxide dispersion hardened alloy and a cladding of a heat resistant alloy which is compatible with said core material, said reinforcing cores each being individually wholly encapsulated and bonded to said cladding material wherein the ratio of cross-sectional area of said cores and said cladding area is from 0.05 to 2:1.

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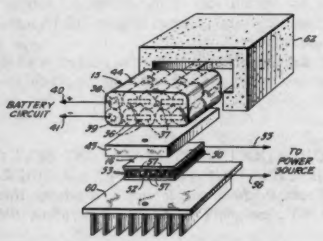
## 4,314,008
## THERMOELECTRIC TEMPERATURE STABILIZED BATTERY SYSTEM

Charles R. Blake, El Segundo, Calif., assignor to General Electric Company, Gainesville, Fla.

Filed Aug. 22, 1980, Ser. No. 179,959

Int. Cl.³ H01M *14/00*

U.S. Cl. 429—8 9 Claims




1. A temperature-stabilized battery system adapted for operation in an environment having a different temperature than the system, comprising:

a battery having at least one electrochemical cell;

a Peltier type heat pump module having a hot thermal transfer face, a cold thermal transfer face and means for transferring thermal energy therebetween, one of the thermal transfer faces being in thermal transfer relation to said battery;

thermal insulation means surrounding at least a portion of said battery for reducing the flow of thermal energy to and from the battery; and

a heat sink in thermal transfer relation to the other thermal transfer face of said heat pump module and exposed to the environment exterior to said battery for transferring thermal energy from said hot thermal transfer face to said cold thermal transfer face.

## 4,314,009
## BATTERY

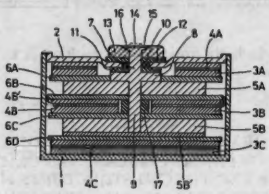
Hironosuke Ikeda, Hirakata, and Shigehiro Nakaido, Kobe, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Dec. 2, 1980, Ser. No. 212,204

Claims priority, application Japan, Dec. 7, 1979, 54/170028[U]; Dec. 7, 1979, 54/170029[U]; Jan. 30, 1980, 55-11062[U]

Int. Cl.³ H01M *2/26*

U.S. Cl. 429—161 7 Claims




1. A battery comprising:

an electrode assembly formed by alternately superposing each of at least two electrode plates having one polarity on at least one electrode plate having the other polarity with each of separator layers disposed therebetween;

a battery vessel for housing said electrode assembly and constituted by a metallic outer case and a metallic closure cover joined to said metallic outer case;

a collector rod having a flange located inside said closure cover, said collector rod passing through a through-bore formed in said closure cover, through an insulating member such that one end of said collector rod is projected from said closure cover; and

a metallic ring fitted to the projected portion of said collector rod with an insulating member disposed between said ring and said closure cover;

the head of said projected portion of said collector rod being crushed,

said crushed portion being embedded in a concave portion formed in the top surface of said ring,

said at least two electrode plates having said one polarity being electrically connected to said battery vessel;

said at least one electrode plate having said other polarity being electrically connected to said collector rod.

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## 4,314,010
## SOLID STATE CELL EMPLOYING AN ELECTRON DONOR-EMBEDDED ANODE

Demetrios V. Louzos, Rocky River, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 29, 1980, Ser. No. 192,003

Int. Cl.³ H01M *4/60*

U.S. Cl. 429—191 10 Claims

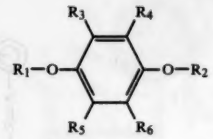
1. A solid state cell comprising an anode, a solid electrolyte and a charge transfer complex cathode in which the complex is the reaction product of a first electron donor and an electron acceptor; the improvement wherein a minor amount of a second electron donor in particulate form is at least partially embedded in the anode and said second electron donor being at least partially exposed to the electron acceptor so that it effectively provides a network extension of a complex cathode into the anode.

## 4,314,011
## COLOR PHOTOGRAPHIC MATERIAL

Takashi Uchida; Takashi Sasaki; Shoji Kikuchi, all of Hino; Katsuo Mogaki, Odawara; Masahiko Taguchi, Odawara, and Syun Takada, Odawara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 939,968, Sep. 6, 1978. This application Jun. 20, 1980, Ser. No. 161,608
Claims priority, application Japan, Sep. 12, 1977, 52-110363
Int. Cl.³ G03C 5/24
U.S. Cl. 430—17 5 Claims

1. A color photographic material comprising a support and a hydrophilic layer containing a dye image which material contains a compound represented by the following formula (I):



Formula (I)

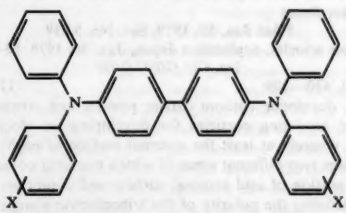
wherein $R_1$ and $R_2$ each represent an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group or a heterocyclic ring, and when $R_1$ and $R_2$ both are an alkyl group, the sum of the carbon atoms of said alkyl group is not less than 3; two of $R_3$, $R_4$, $R_5$ and $R_6$ represent an alkyl, alkenyl or alkoxy group of up to 32 carbon atoms and the other two represent hydrogen; and each of said compound does not substantially react with the oxidized form of a developer to form a coloring dye.

## 4,314,012
## PHOTOCONDUCTIVE REFLEX EXPOSURE MEMBER

Steven J. Grammatica, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 27, 1980, Ser. No. 182,173
Int. Cl.³ G03C 5/10; G03G 5/10, 5/14
U.S. Cl. 430—31 16 Claims

1. A reflex exposure imaging member comprising a transparent conductive support member, a photoconductive layer disposed on said conductive support member and an optical screen disposed between said photoconductive layer and said support member, said photoconductive layer comprising an insulating resinous binder material containing from about 0.1 to about 1 part by weight of a benzidine compound per part of insulating resinous binder material and having the formula:

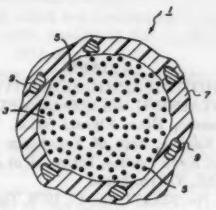


where X is a member selected from the group consisting of alkyl having 1 to 4 carbon atoms, resinous binder, and about 0.001 to 10 salts percent by weight, based on the weight of the benzidine compound, of a salt selected from the group consisting of pyrylium salts, thiapyrylium salts and selenapyrylium salts, said photoconductive layer having a thickness of from about 5 to about 20 microns and an optical density of from about 0.1 to about 0.8.

## 4,314,013
## PARTICLE FORMATION BY DOUBLE ENCAPSULATION

Yew C. Chang, Oakville, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 4, 1979, Ser. No. 27,176
Int. Cl.³ G03G 17/04; 204 181/32
U.S. Cl. 430—37 11 Claims



1. In an imaging process comprising providing first and second surfaces, sandwiching between said surfaces an imaging suspension comprising electrically photosensitive particles dispersed in an electrically insulating liquid vehicle, while subjecting said suspension to an electrical field, exposing said imaging suspension to a pattern of electromagnetic radiation to which said particles are sensitive and separating the surfaces whereby the exposed particles are retained on one of said surfaces and the unexposed particles are retained on the other surface, the improvement wherein said particles comprise double encapsulated particles comprising a colorant encapsulated in a first resin and second resin encapsulating said first resin, said second resin having embedded therein electrically photosensitive material, and said first resin capable of substantially preventing dark charge injection of said photosensitive material by said colorant.

## 4,314,014
## ELECTROPHOTOGRAPHIC PLATE AND PROCESS FOR PREPARATION THEREOF

Hideaki Yamamoto, Hachioji; Akio Taniguchi, Hino; Shinkichi Horigome, Tachikawa; Susumu Saito, Hachioji; Yoshiaki Mori, Tokyo, and Eiichi Maruyama, Kadaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 11, 1980, Ser. No. 158,369
Claims priority, application Japan, Jun. 15, 1979, 54-74661; Oct. 19, 1979, 54-134163
Int. Cl.³ G03G 5/08, 5/082
U.S. Cl. 430—57 20 Claims

1. An electrophotographic plate having a substrate and a laminated structure of Se layers on said substrate, at least the surface of the substrate nearer said laminated structure being electrically conductive, the laminated structure comprising, in the following sequence,

(a) a first Se layer containing 3 to 10% by weight As and having a thickness in a range 20 nm–1 μm,

(b) a second Se layer containing 40 to 47% by weight Te and 3 to 10% by weight As and having a thickness in a range 60 nm–300 nm,

(c) a third Se layer which contains at least one member selected from the group consisting of As at maximum concentration of 30 to 40% by weight and Ge at maximum concentration of 10 to 30% by weight and having a thickness in a range 60 nm–200 nm, said third Se layer having a bandgap intermediate between the respective bandgaps of said second layer and a fourth layer, and

(d) a fourth layer which is an Se layer containing up to 10% by weight of As,

wherein either the first layer or said fourth layer is nearest to the said electrically conductive surface of the substrate,

whereby said plate has a sensitivity to beams having a wavelength of 550–800 nm.

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**4,314,015**

## ELECTROPHOTOGRAPHIC SENSITIVE MATERIALS CONTAINING DISAZO COMPOUNDS

**Mitsuru Hashimoto, Hino; Kiyoshi Sakai, Tokyo; Masafumi Ohta; Akio Kozima, both of Yokohama; Masaomi Sasaki, Kawasaki, and Kyoji Tsutsui, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 925,157, Jul. 17, 1978. This application Dec. 19, 1980, Ser. No. 218,382**

**Claims priority, application Japan, Jul. 18, 1977, 52-84976; Jul. 18, 1977, 52-84977; Jul. 19, 1977, 52-86255; Jul. 22, 1977, 52-87351**

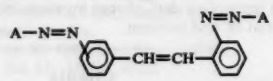
**Int. Cl.³ G03G 5/06**

**U.S. Cl. 430—58** **16 Claims**

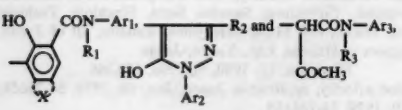
5. An electrophotographic material which comprises an electrically conductive support and a photosensitive layer formed thereon, said photosensitive layer consisting essentially of fine particles of disazo pigment selected from the group consisting of disazo pigments having the formulas I and III,

formula I:

formula III:



wherein A is selected from the group consisting of



wherein

is a fused ring selected from the group consisting of benzene ring, halobenzene ring, naphthalene ring, indole ring, carbazole ring and benzofuran ring; $Ar_1$ is a member selected from the group consisting of phenyl, methylphenyl, methoxyphenyl, chlorophenyl, nitrophenyl, ethoxyphenyl, methylchlorophenyl, dimethylphenyl, methoxychlorophenyl, methoxybromophenyl, methoxymethylphenyl, dimethoxyphenyl, dimethoxychlorophenyl, dimethylaminophenyl, cyanophenyl, carboxyphenyl, benzenesulfonic acid sodium salt, tert-butoxyphenyl, naphthyl, methoxydibenzofuryl and carbazolyl; each of $Ar_2$ and $Ar_3$ is a member selected from the group consisting of phenyl, naphthyl, methoxyphenyl, methylphenyl, acetylaminophenyl, dimethylaminophenyl, cyanophenyl, nitrophenyl, dinitrophenyl, chlorophenyl, trichlorobenzenesulfonic acid, benzenesulfonic acid and benzenesulfonamide; each of $R_1$ and $R_3$ is a member selected from the group consisting of hydrogen, methyl, ethyl, phenyl and chlorophenyl; and $R_2$ is a member selected from the group consisting of methyl, carboxyl and $—COOC_2H_5$; a charge-transfer substance and a resinous binder.

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**4,314,016**

## ELECTROPHOTOGRAPHIC ELEMENT HAVING A BISAZO PHOTOCONDUCTOR

**Masafumi Ohta; Mitsuru Hashimoto, and Kyoji Tsutsui, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan**

**Filed Jun. 11, 1980, Ser. No. 158,436**

**Claims priority, application Japan, Jun. 20, 1979, 54-78346**

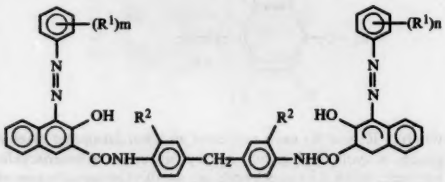
**Int. Cl.³ G03G 5/06**

**U.S. Cl. 430—59** **24 Claims**

1. An electrophotographic element comprising;

an electrically conductive layer;

a charge generation layer on the electrically conductive layer, the charge generation layer having a thickness of from 0.01μ to 5μ and comprising particles of disazo pigment having a particle size of 5μ or less, said disazo pigment having the formula;



wherein

$R^1$ is hydrogen, chlorine, bromine, methyl, ethyl, methoxy, ethoxy, nitro, dimethylamino, diethylamino or phenyl; m and n are each an integer of 1 or 2 and the $R^1$ groups are the same or different when m and n are 2; and

$R^2$ is hydrogen or chlorine;

and a charge transport layer adjacent the charge generation layer, the charge transport layer having a thickness of from 3μ to 50μ and comprising a polymeric binder.

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**4,314,017**

## DEVELOPER WITHOUT CARRIER POWDER HAVING AN IMPROVED TRIBOELECTRIC CHARGING PROPERTY

**Tohru Takahashi; Tsutomu Toyono; Junichiro Kanbe, all of Tokyo; Shunji Nakamura, and Yasuyuki Tamura, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 19, 1979, Ser. No. 5,018**

**Claims priority, application Japan, Jan. 26, 1978, 53-7705**

**Int. Cl.³ G03G 9/08**

**U.S. Cl. 430—109** **12 Claims**

1. A developer without carrier powder and composed of colored insulating particles for developing an electrostatic image, wherein at least the external surface of each particle comprises two different areas of which one area constitutes a major portion of said external surface and comprises an element defining the polarity of the triboelectric charge of said particle to a determined polarity while the other area comprises an element capable of being easily separated from said particle, transferred to a surface of a developing device and charged in a polarity opposite to that of said particle, wherein the surface area ratio of said one area to said other area is within a range of 5:1 to 500:1.

10. A developer according to claim 1, wherein said element for defining the polarity of the triboelectric charge is a binder resin.

4,314,018

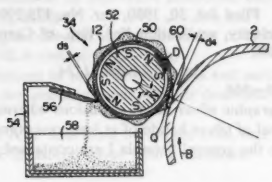
## CLEANING PROCESS FOR AN ELECTROSTATIC COPYING APPARATUS

Shoji Matsumoto, Neyagawa; Toshikazu Matsui, Kishiwada; Toshimitsu Ikeda, Higashiosaka; Nobuhiko Kozuka, Suita; Hitoshi Nishihama, Uji, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

Division of Ser. No. 895,465, Apr. 11, 1978, Pat. No. 4,254,202. This application Oct. 26, 1979, Ser. No. 88,654

Int. Cl.³ G03G *13/22, 21/00*

U.S. Cl. 430—125 3 Claims




1. An electrostatic copying process which comprises (1) the step of forming an electrostatic latent image on the surface of a photosensitive member having a photoconductive layer, (2) the step of developing the electrostatic latent image by applying a monocomponent developer composed of a conductive or semiconductive fine magnetic powder to the electrostatic latent image to form a toner image on the surface of the photosensitive member, (3) the step of transferring the toner image by conveying a receptor sheet to a transfer station and successively contacting the surface of the photosensitive member closely with the surface of the receptor sheet at the transfer station to transfer the toner image to the surface of the receptor sheet, (4) the step of fixing the toner image by separating the receptor sheet from the surface of the photosensitive member and fixing the toner image transferred onto the surface of the receptor sheet, (5) the step of eliminating electrostatic charge from the photosensitive member by irradiating the surface of the photosensitive member with an electrostatic eliminating lamp after the toner image has been transferred to the receptor sheet, and (6) the step of cleaning the surface of the photosensitive member by removing the developer remaining on the surface of the photosensitive member after the electrostatic charge eliminating step, said step of removing the developer being carried out by providing a developer-holding member, magnetically holding the same kind of developer as used in the developing step on the surface of said developer-holding member by providing a stationary magnet disposed within the developer-holding member, moving the surface of the developer-holding member in a direction opposite to the moving direction of the surface of the photosensitive member while contacting the two surfaces through the layer of the developer, whereby the surface of the photosensitive member is mechanically brushed by the layer of the developer, said developer-holding member being a rotatable hollow cylindrical sleeve, said magnet being a roll-like permanent magnet having a plurality of magnetic poles, and one of the magnetic poles which is located most closely to a position at which the surface of the developer-holding member is closest to the surface of the photosensitive member being positioned, during cleaning, downstream in the rotation direction of the developer-holding member by a certain angle with respect to the position at which the two surfaces are closest to each other.

4,314,019

## TRANSITION METAL PHOTOREDUCTION SYSTEMS AND PROCESSES

Anthony Adin, Rochester, and James C. Fleming, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 720,873, Sep. 7, 1976, Pat. No. 4,201,588, Division of Ser. No. 618,186, Sep. 30, 1975, abandoned, and a continuation-in-part of Ser. No. 618,186, Sep. 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 461,057, Apr. 15, 1974, abandoned. This application Aug. 2, 1979, Ser. No. 63,643

The portion of the term of this patent subsequent to May 6, 1997, has been disclaimed.

Int. Cl.³ G03C *1/72*

U.S. Cl. 430—202 3 Claims

1. In an integral imaging element comprising a support, a radiation-sensitive layer capable of generating amines and an image-recording layer distinct from said radiation-sensitive layer and responsive to said amines to form an image corresponding to that of the imagewise exposure of said radiation-sensitive layer, said layers being disposed on said support;

the improvement wherein said radiation-sensitive layer comprises, in chemical association, (a) a reducible, inert cobalt(III) complex free of a sensitizable anion and containing amine ligands, and (b) a quinone capable of forming in the absence of a cobalt(III) complex, upon exposure to activating radiation longer than 300 nanometers in wavelength, a reducing agent that forms a redox couple when associated with said complex, said quinone incorporating one or more labile hydrogen atoms.

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4,314,020

## COLOR TRANSFERS ASSEMBLAGES WITH TWO TIMING LAYERS AND A NEUTRALIZING LAYER

Kenneth J. Reed; Patrick H. Saturno, both of Rochester, and Gerald L. Ducharme, Naples, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 4, 1980, Ser. No. 175,224

Int. Cl.³ G03C *7/00, 5/54, 1/40*

U.S. Cl. 430—215 29 Claims

1. In a photographic assemblage comprising:

(a) a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material;

(b) a dye image-receiving layer;

(c) a neutralizing layer for neutralizing an alkaline processing composition;

(d) a first timing layer located between said neutralizing layer and said photosensitive silver halide emulsion layer; and

(e) a second timing layer located between said first timing layer and said neutralizing layer;

said first and second timing layers being so located that said processing composition must first permeate said timing layers before contacting said neutralizing layer, said neutralizing layer being located on the side of said second timing layer which is farthest from said dye image-receiving layer, the improvement wherein:

(i) said first timing layer contains photographic addenda for substantially terminating development of said silver halide emulsion layer; and

(ii) said second timing layer being capable of being permeated by said alkaline processing composition only after said silver halide development has been substantially terminated.

4,314,021

## PHOTOGRAPHIC ELEMENT HAVING A LAYER OF LIPID COMPOUND

David F. O'Brien; Thomas H. Whitesides, and Richard T. Klingbiel, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 11, 1980, Ser. No. 176,731
Int. Cl.³ G03C 1/68
U.S. Cl. 430—270 17 Claims

1. A photographic element comprising a support having thereon a layer comprising a monomeric lipid having at least one hydrophobic acyl chain containing at least two conjugated acetylenic linkages.

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4,314,022

## PHOTORESIST DEVELOPERS AND PROCESS

Richard S. Fisch, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 5, 1980, Ser. No. 146,642
Int. Cl.³ G03C 5/00
U.S. Cl. 430—326 10 Claims

1. A process for forming an image on a photosensitive element comprising (1) a substrate, (2) a metal containing layer on said substrate, and (3) a photoresist layer on said aluminum containing layer, which photoresist layer becomes differentially soluble in aqueous alkaline solution in light struck versus non-light struck areas, said process comprising exposing said element to light of sufficient intensity to cause light struck and non-light struck areas of said photoresist to become differentially soluble in aqueous alkaline solution and then developing said element by agitating the element in contact with a developing solution comprising an aqueous alkaline solution having a pH of from 12.5 to 13.7 containing an alkali metal hydroxide and a chelating agent for aluminum ion having a stability constant of greater than 6.7.

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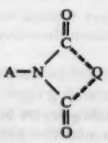
4,314,023

## PHOTOGRAPHIC SILVER HALIDE MATERIALS CONTAINING YELLOW COUPLER

Tamotsu Kojima, Kokubunji; Hiroyuki Imamura, Hachioji; Mitsuto Fujiwhara, Hachioji; Wataru Fujimatsu, Hachioji, and Takaya Endo, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 410,361, Oct. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 315,667, Dec. 15, 1972. This application Nov. 24, 1980, Ser. No. 210,135
Claims priority, application Japan, Dec. 17, 1971, 46-101848; Dec. 17, 1971, 46-101850; Mar. 15, 1972, 47-25754
Int. Cl.³ G03C 7/00, 1/40
U.S. Cl. 430—389 3 Claims

1. A process for forming a yellow dye image, which comprises bringing a yellow coupler having the formula



wherein A is a yellow coupler residue defined by removing one hydrogen atom of an active methylene group from a yellow coupler having the active methylene group; Q is a group having a formula

wherein Z is a hydrogen atom or an alkyl, aryl or aralkyl group; into contact with exposed silver halide crystals in the presence of a color developer for said silver halide crystals.

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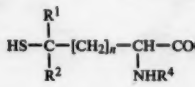
4,314,024

## STABILIZED PHOTOGRAPHIC EMULSION, A PROCESS FOR ITS PREPARATION AND STABILIZED PHOTOGRAPHIC MATERIALS

Herbert Gernert, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 30, 1980, Ser. No. 173,709
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1979, 2931690
Int. Cl.³ G03C 1/34
U.S. Cl. 430—564 8 Claims

1. Photographic silver halide emulsions wherein at the most 9 mg per mol of silver halide of at least one compound corresponding to the general formula I are contained:



I

in which

$R^1$ represents hydrogen or an alkyl, aryl, aralkyl or acyl group;

$R^2$ represents an alkyl, aryl, aralkyl or acyl group;

$R^3$ represents hydrogen or a cation;

$R^4$ represents hydrogen or an alkyl group and

n represents 0 or a whole number, and/or

$R^1$ and $R^2$ together represent the atoms required to complete a ring,

and/or the corresponding disulphide.

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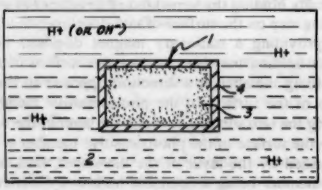
4,314,025

## BLOOD PRESERVATION ANTICOAGULANT SOLUTION

John P. McCue, San Diego, Calif., assignor to SBR Lab, Inc., Elgin, Ill.

Division of Ser. No. 892,371, Apr. 4, 1978. This application Jun. 25, 1979, Ser. No. 51,697
Int. Cl.³ A01N 1/02
U.S. Cl. 435—2 1 Claim




1. An anticoagulant solution for preservation of whole blood under blood banking conditions comprising an admixture of an anticoagulant solution selected from ACD and CPD solutions with sufficient $MgCl_2$ to provide from 0.01 to 5 millimoles $Mg^{+2}$ ion in the resultant mixture of collected blood and anticoagulant.

**4,314,026**

## PROCESS FOR DETERMINING THE COMPLEMENT-DEPENDENT CYTOTOXICITY MEDIATED BY ANTI-HLA ANTIBODIES BY MEANS OF ATP DETERMINATION AND DEVICE FOR ATP DETERMINATION

**Beatrice Descamps-Latscha, Paris, France, assignor to Institut National de La Sante et de La Recherche Medicale, Paris, France**

**Filed Mar. 31, 1980, Ser. No. 136,056**
**Int. Cl.³ C12Q *1/66*; G01N *33/54***
**U.S. Cl. 435—7** **7 Claims**

1. A process for determining the complement-dependent cytotoxicity mediated by anti-HLA antibodies contained in a test serum comprising:
combining target cells and test serum under conditions resulting in anti-HLA-coated target cells,
adding complement to the combined cells and serum,
incubating under conditions suitable for demonstrating cytotoxicity,
measuring the ATP loss from the target cells, and
comparing the measured value with a standard.

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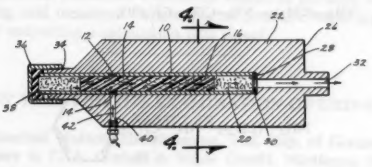
**4,314,027**

## METHOD OF DETECTING MOLD TOXIN INFECTED GRAINS

**Henry M. Stahr, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa**

**Filed Jul. 21, 1980, Ser. No. 170,726**
**Int. Cl.³ B01D *15/08***
**U.S. Cl. 435—34** **4 Claims**



1. A pattern recognition method of detecting mold and fungal infected grains, comprising:
stripping a gaseous sample from the grain which is representative of volatiles which are produced within the grain,
collecting said gaseous sample volatiles on a gas absorbing substance,
determining by gas chromatographic analysis if said gaseous samples contain $C_7$ to $C_9$ aldehyde, alcohol or ketone volatiles known to be produced by fungal and mold species, in infected grains.

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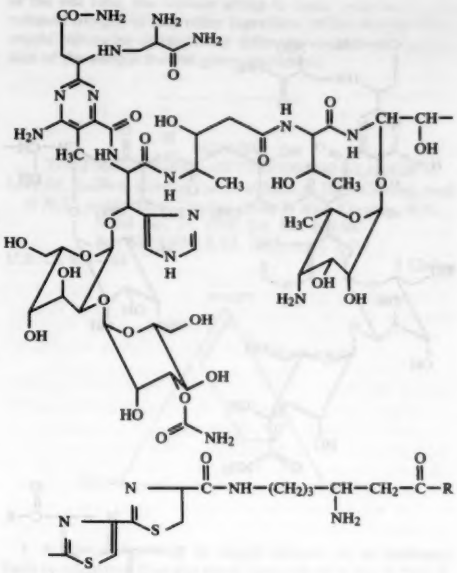
**4,314,028**

## FERMENTATION PROCESS FOR PRODUCING TALLYSOMYCIN COMPOUNDS

**Takeo Miyaki; Osamu Tenmyo; Masataka Konishi, all of Yokohoma, and Hiroshi Kawaguchi, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.**

**Division of Ser. No. 57,528, Jul. 13, 1979, Pat. No. 4,246,400. This application Jan. 3, 1980, Ser. No. 109,427**
**Int. Cl.³ C12P *19/58***
**U.S. Cl. 435—77** **3 Claims**

1. A process for producing a tallysomycin derivative selected from the group consisting of (1) a tallysomycin A derivative of the formula



wherein R is:

—NH—$(CH_2)_3$—$NH_2$

—NH—$(CH_2)_3$—$S^{\oplus}(CH_3)_2$

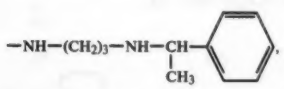
—NH—$(CH_2)_3$—NH—$CH_2$—$CH_2OH$

—NH—$(CH_2)_3$—$N(CH_2CH_2OH)_2$

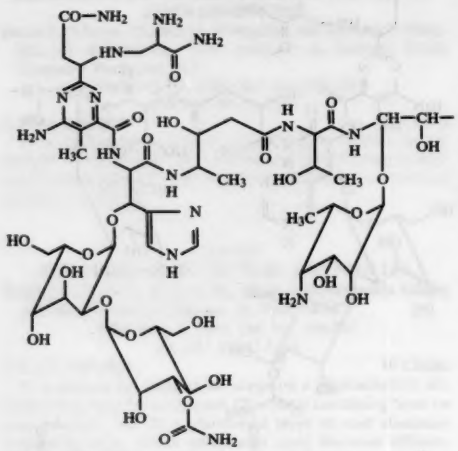
—NH—$(CH_2)_4$—$NH_2$

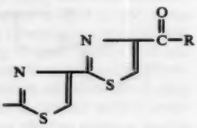
—NH—$(CH_2)_3$—NH—$CH_3$

or



or a pharmaceutically acceptable acid addition salt thereof, and (2) a tallysomycin B derivative of the formula



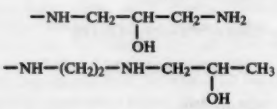


wherein R is:

$-NH-(CH_2)_3-NH_2$

$-NH-(CH_2)_3-S^{\oplus}(CH_3)_2$

$-NH-(CH_2)_2-NH_2$



$-NH-(CH_2)_3-NH-CH_2-CH_2OH$

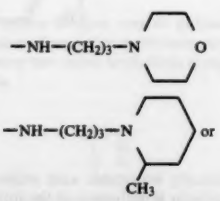
$-NH-(CH_2)_3-N(CH_3)_2$

$-NH-(CH_2)_3-N(CH_2CH_2OH)_2$

$-NH-(CH_2)_2-NH-CH_2-CH_2OH$

$-NH-(CH_2)_4-NH_2$

$-NH-(CH_2)_3-NH-CH_3$



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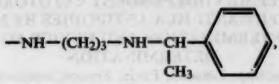
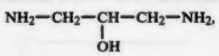


or a pharmaceutically acceptable acid addition salt thereof, which comprises cultivating a tallysomycin-producing strain of *Streptoalloteichus hindustanus* in an aqueous nutrient medium in the presence of an amine-precursor compound having the formula

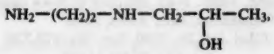
$NH_2-(CH_2)_2-NH_2$,

$NH_2-(CH_2)_3-NH_2$,

$NH_2-(CH_2)_4-NH_2$,

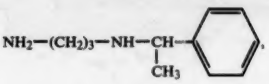


$NH_2-(CH_2)_2-NH-CH_2-CH_2OH$,



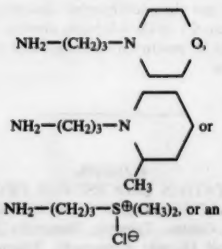
$NH_2-(CH_2)_3-NH-CH_3$,

$NH_2-(CH_2)_3-NH-CH_2-CH_2OH$,



$NH_2-(CH_2)_3-N(CH_3)_2$,

$NH_2-(CH_2)_3-N(CH_2CH_2OH)_2$,



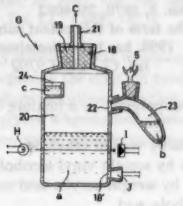
inorganic acid addition salt thereof, said amine-precursor compound corresponding to the terminal amine R group of the desired derivative, until a substantial amount of the desired tallysomycin derivative is produced by said organism in said culture medium and recovering the desired tallysomycin derivative from the culture medium substantially free of co-produced substances.

4,314,029

## APPARATUS FOR AUTOMATICALLY MEASURING CHANGES IN AMOUNT OF GAS

Yukio Ohtake, and Masahiro Nakamura, both of Tokyo, Japan, assignors to Ohtake Works Company, Ltd., Tokyo, Japan

Filed Feb. 1, 1980, Ser. No. 117,736
Claims priority, application Japan, Feb. 7, 1979, 54-12283
Int. Cl.³ C12M 1/34
U.S. Cl. 435—291 10 Claims



1. Apparatus for automatically measuring changes in oxygen absorption during material activity such as changes in enzyme activity, photosynthesis of plants, and biochemical oxygen demand, comprising a closed vessel means having a main chamber in which an activity material whose activity is to be measured is contained, said vessel also having a subchamber in which a liquid substrate is contained, a shelf provided on the upper inner surface of said vessel means for housing an absorbent, a pressure sensing means attached to said closed vessel means for converting a change in oxygen partial pressure within said vessel means into an electric signal and outputting a measured oxygen partial pressure value signal, and an arithmetic circuit means for effecting calculation according to a predetermined numerical expression stored in advance after inputting said measured oxygen partial pressure value signal and for outputting a calculation data signal.

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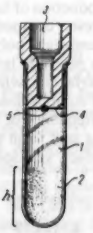
4,314,030

## TEST TUBE FOR THE EXAMINATION OF URINE SAMPLES

Hans-Joachim Habich, Hildrizhausen, Fed. Rep. of Germany, assignor to C. A. Greiner & Söhne GmbH, Nürtingen, Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 123,930
Int. Cl.³ C12M 1/24
U.S. Cl. 435—296 10 Claims



1. A test tube for the examination of samples, especially of urine samples, for the amount of a given ingredient in the sample, comprising catalase and oxidase contained in at least one layer on at least a part of the inner surface of the test tube, and a solid peroxide substance received in the interior of the test tube, introduction of the sample into the test tube entailing dissolution of said layer and said substance which are present in sufficient amounts whereby the peroxide thus releases sufficient oxygen under the influence of the catalase in the interior of the test tube, the oxidase acting to cause oxidation by the released oxygen of any other ingredient of the sample which would otherwise deleteriously influence subsequent examination of the sample for the given ingredient.

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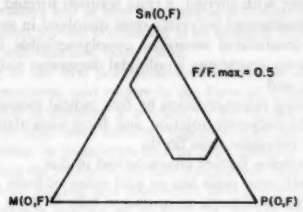
4,314,031

## TIN-PHOSPHORUS OXYFLUORIDE GLASSES

Leon M. Sanford, Painted Post, and Paul A. Tick, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 17, 1980, Ser. No. 160,387
Int. Cl.³ C03C 3/04, 3/10, 3/12, 3/00
U.S. Cl. 501—44 5 Claims




1. A glass comprising, in weight percent on an elemental basis as calculated from the batch, about 20–85% Sn, 2–20% P, 3–20% O, 10–36% F, and at least 75% total of Sn+P+O +F.

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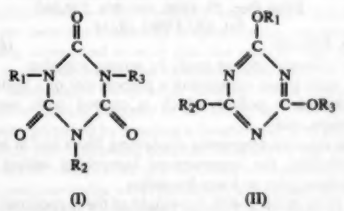
4,314,032

## CROSSLINKED POLYVINYL ALCOHOL GEL

Naohiro Murayama, and Teruo Sakagami, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

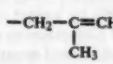
Filed Oct. 17, 1979, Ser. No. 85,682
Claims priority, application Japan, Oct. 26, 1978, 53/131785; Feb. 2, 1979, 54/011246
Int. Cl.³ C08F 8/12
U.S. Cl. 521—52 9 Claims

1. A crosslinked non-ionic polyvinyl alcohol gel useful as a packing for gel chromatography which is obtained by a process, comprising: copolymerizing 100 parts by weight of a vinylacylate and 0.1 to 50 parts by weight of a crosslinking agent having the formula (I) or (II):



(I) (II)

wherein $R_1$, $R_2$ and $R_3$ are the same or different and each is selected from the group consisting of $-CH_2-CH=CH_2$, $-CH_2-C\equiv CH$ and



and hydrolyzing the product.

4,314,033

## CROSS LINKED POLYESTER

John Gillan, Langwarrin, and Colin M. Richards, Black Rock, both of Australia, assignors to Dulux Australia Ltd., Melbourne, Australia

Division of Ser. No. 68,391, Aug. 21, 1979, Pat. No. 4,273,830.
This application Nov. 19, 1980, Ser. No. 208,414
Claims priority, application Australia, Sep. 12, 1978, PD5907
Int. Cl.³ C08J 9/28
U.S. Cl. 521—65 4 Claims

1. A process of preparing fibrils of vesiculated crosslinked polyester resin wherein the diameter is from 1 μm to 2 mm, the length from 50 μm–5 cm and the aspect ratio from 10 to 50, characterised in that the fibres are prepared by a suspension polymerisation process comprising the stages of

(a) pouring with stirring, a resin solution formed carboxylated unsaturated polyester resin dissolved in an ethylenically unsaturated monomer copolymerisable therewith, into water containing a colloidal dispersion stabiliser and a base, and

(b) initiating polymerisation by free radical means to crosslink the polyester solution and form vesiculated, crosslinked polyester resin fibrils;

the process being further characterised in that

(c) the polyester resin has an acid value of from 10–90 mg KOH per g of resin, comprises at least 40% by weight of the said resin solution and is selected according to a buoyancy test in which a drop of the resin solution used in the preparation of fibrils is added to the surface of water whose pH has been adjusted with ammonia to at least 10, the drop remains at or near the surface for an appreciable time, and

(d) the base has a dissociation exponent ($pK_b$ value) of less than 8, and is present such that there are 1–3 equivalents of base for each carboxyl group present in the polyester resin.

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4,314,034

## POLYUREA POLYURETHANE FOAMED SPONGE WITH HIGH WET STRENGTH

Glenn E. Fulmer, Clarksville, and Conrad Vollmerhausen, Fulton, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,563
Int. Cl.³ C08G 18/14
U.S. Cl. 521—65 16 Claims

1. In a foamed sponge made by mixing together

(a) a resin phase comprising a prepolymer of a hydrophilic oxyalkylene polyol which is capped with isocyanate groups, and

(b) an aqueous suspension containing fibers and at least one surfactant, the improvement comprising adding to the mixture prior to foam formation

(i) from about 1–40% by weight of the prepolymer of part (a) of a polymeric polyisocyanate selected from the group consisting of 4,4′-diphenylmethane diisocyanate, and a mixture of 4,4′-diphenylmethane diisocyanate and polymethylene polyphenylisocyanates, said mixture having an average functionality of about 2.0 to 3.0, and

(ii) from about 0–40% by weight of the aqueous suspension of part (b) of diatomaceous earth,

whereby an open cell foamed sponge is obtained having a reduced volume swell, rapid wet out and improved wet strength.

4,314,035

## METHOD FOR THE PREPARATION OF POLYMER FOAMS

John-Victor Hobes, Dinslaken, and Wolfgang Payer, Wesel, both of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Continuation of Ser. No. 55,880, Jul. 9, 1979, Pat. No. 4,246,357, and a continuation of Ser. No. 115,782, Jan. 28, 1980, abandoned. This application Aug. 20, 1980, Ser. No. 179,864
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1978, 2830328; Feb. 3, 1979, 2904082
The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.
Int. Cl.³ C08J 9/02
U.S. Cl. 521—77 25 Claims

1. A foamable copolymer or a mixture of copolymers comprising

(a) 35% to 98% by weight ethylene;

(b) 1% to 30% by weight vinyl alcohol;

(c) 1% to 30% by weight acrylic acid esters of secondary or tertiary alcohols; and

(d) 0% to 5% by weight vinyl ester; all percentages being based on the total weight of said copolymer or said mixture.

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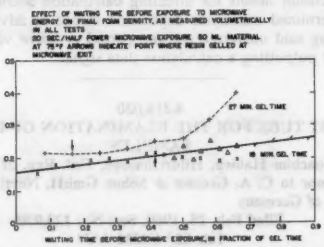
4,314,036

## UNSATURATED POLYESTER RESIN FOAMS AND PRODUCTS CONTAINING THE SAME

James L. Throne, Naperville, and Richard E. Graves, Jr., Elgin, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 24, 1979, Ser. No. 78,301
Int. Cl.³ C08J 9/00
U.S. Cl. 521—99 5 Claims


EFFECT OF WAITING TIME BEFORE EXPOSURE TO MICROWAVE ENERGY ON FINAL FOAM DENSITY, AS MEASURED VOLUMETRICALLY IN ALL TESTS 50 SEC./HALF POWER MICROWAVE EXPOSURE, 50 ML. MATERIAL AT 75°F ARROWS INDICATE POINT WHERE RESIN GELLED AT MICROWAVE EXIT
27 MIN. GEL TIME
9 MIN. GEL TIME
WAITING TIME BEFORE MICROWAVE EXPOSURE, IN FRACTION OF GEL TIME

1. A process for the production of foamed products from and unsaturated polyester resin composition, said composition comprising flexible or semi-rigid polyester resin, unsaturated monomer, a promoter, a peroxide initiator, physical blowing agent, and compatible surfactant whereby a known gel time "T" results, foaming said composition by exposing it to microwave radiation having a frequency of at least 640 MHz prior to 1 T, thereafter permitting said foam structure to exotherm to obtain a fully cured product, said foaming taking place at or slightly prior to 1 T.

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4,314,037

## HETERO NITROGEN CATALYSTS

Burton D. Beitchman, Springfield, and Rocco L. Mascioli, Media, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 15, 1980, Ser. No. 216,043
Int. Cl.³ C08G 18/14, 18/20
U.S. Cl. 521—125 14 Claims

1. Compositions for the production of urethane and isocyanurate foam products by reaction of an organic polyisocyanate with a polyol in the presence of tertiary amine catalyst, characterized in that said tertiary amine catalyst is comprised

wholly or partly of an alkali metal salt of an azole compound containing at least two hetero nitrogen atoms.

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4,314,038
GRAFT POLYOL RIM SYSTEM POSSESSING EXCELLENT THERMAL PROPERTIES

Robert A. Markovs, Canton, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Mar. 30, 1981, Ser. No. 248,882
Int. Cl.³ C08G 18/14
U.S. Cl. 521—167 10 Claims

1. A dimensionally stable reaction injection molded polyurethane elastomer comprising the reaction product of an organic polyisocyanate, a polyoxyalkylene polyether polyol, a blowing agent and ethylene glycol wherein said elastomer contains less than 0.10 percent free water prior to curing at 120° C. to 210° C.

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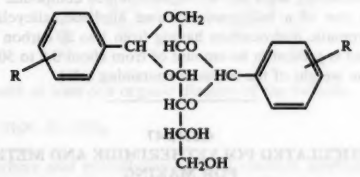
4,314,039
POLYPROPYLENE COMPOSITION CONTAINING A 1,3,2,4-DI(ALKYLBENZYLIDENE) SORBITOL

Yoichi Kawai; Katsuyoshi Sasagawa, both of Yokohama; Masami Maki, Kawasaki; Hozumi Ueda, and Masayoshi Miyamoto, both of Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Aug. 6, 1980, Ser. No. 175,726
Claims priority, application Japan, Aug. 21, 1979, 54/105523
Int. Cl.³ C08K 5/06
U.S. Cl. 525—1 8 Claims

1. A composition comprising 100 parts by weight of isotactic polypropylene or crystalline copolymers of propylene and ethylene or propylene and alpha-olefins or mixtures thereof and 0.005 to 8 parts by weight of a 1,3,2,4-di(alkylbenzylidene) sorbitol of the formula



wherein R represents an alkyl group having 2 to 18 carbon atoms.

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4,314,040
SOLID ANTISTATIC COMPOSITIONS

Anthony J. Castro, Oak Park, and James W. Stoll, Woodridge, both of Ill., assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 955,561, Oct. 27, 1978, Pat. No. 4,210,556, which is a division of Ser. No. 622,643, Oct. 15, 1975, Pat. No. 4,147,742, which is a continuation-in-part of Ser. No. 436,252, Jan. 24, 1974, abandoned. This application Feb. 11, 1980, Ser. No. 120,178
Int. Cl.³ G08L 71/04; C09K 3/16
U.S. Cl. 525—6 11 Claims

1. An antistatic agent adapted for incorporation into a polymer subject to the development of electrostatic charges to render said polymer antistatic comprising a normally liquid N,N-bis-(2-hydroxyethyl) aliphatic ($C_6$–$C_{18}$) amine having antistatic properties and a resin carrier selected from the group consisting of, polyphenylene oxide-polystyrene blends, said amine being present in an amount of about 10% to about 90%, based on the total weight of the amine and resin carrier and said antistatic agent being a solid with no visually discernible liquid phase.

4,314,041
CONTINUOUS MULTI-ZONE GRAFT POLYMERIZATION

Shin-ichi Shimokawa, Yokkaichi, and Yuji Yamamoto, Suzuka, both of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1980, Ser. No. 190,950
Claims priority, application Japan, Oct. 1, 1979, 54-125351
Int. Cl.³ C08F 155/06
U.S. Cl. 525—53 15 Claims

1. A process for continuously producing an impact-resistant resin having a rubber content of 5 to 30% by weight by solution-graft-polymerization of a monomer mixture of an aromatic vinyl compound and a vinyl cyanide compound in the presence of an ethylene-propylene-non-conjugated diene terpolymer rubber and at least one radical polymerization initiator in an inert solvent containing as an essential component an aromatic hydrocarbon, comprising:

feeding to the first polymerizer of a series of at least two polymerizers, said rubber in the form of a homogeneous solution containing a portion or all of said monomers and/or said inert solvent, together with the remaining monomer or monomers and/or inert solvent;

dispersing the rubber in the first polymerizer and polymerizing with stirring said monomers until the polymerization conversion reaches 40 to 80% by weight based on the monomers; and

further polymerizing the remaining monomers with stirring in the second and succeeding polymerizers to substantially complete the polymerization.

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4,314,042
COMPOSITION FOR POWDER COATING

Jugo Goto, Kawanishi, and Fumihiro Doura, Sakai, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 30, 1980, Ser. No. 173,908
Claims priority, application Japan, Jul. 30, 1979, 54-97780
Int. Cl.³ C08F 8/30
U.S. Cl. 525—59 8 Claims

1. A composition for powder coating which comprises a carboxyl-containing polymer of not lower than 40° C. in softening point prepared by reacting a dicarboxylic acid anhydride with a hydroxyl-containing polymer obtained by saponifying a copolymer of a vinyl ester of a saturated monocarboxylic acid and a copolymerizable vinyl monomer, and a compound having two or more oxazoline rings in the molecule, said hydroxyl-containing polymer comprising 5 to 50 mole % of the vinyl ester of a saturated monocarboxylic acid and 50–95 mole % of the copolymerizable vinyl monomer, and wherein the proportion of the carboxyl-containing polymer to the oxazoline ring-containing compound is such that the ratio of the carboxyl groups in the polymer to the oxazoline rings is 0.5 to 3.0.

5. A composition for powder coating which comprises a carboxyl-containing polymer of not lower than 40° C. in softening point prepared by reacting a dicarboxylic acid anhydride with a hydroxyl-containing polymer obtained by saponifying a copolymer of a vinyl ester of a saturated monocarboxylic acid and a copolymerizable vinyl monomer, a carboxyl-terminated polyester resin, and a compound having two or more oxazoline rings in the molecule, said hydroxyl-containing polymer comprising 5 to 50 mole % of the vinyl ester of a saturated monocarboxylic acid and 50–95 mole % of the copolymerizable vinyl monomer; the proportion of the carboxyl-containing polymer to the oxazoline ring-containing compound is such that the ratio of the carboxyl groups in the polymer to the oxazoline rings is 0.5 to 3.0; and in which the carboxyl-terminated polyester resin is present in such amounts that the ratio of the total carboxyl groups to the oxazoline rings is in a ratio of 0.5 to 3.0.

4,314,043

## FLUORINE-CONTAINING ELASTOMERS

Gen Kojima, Machida; Masayuki Tamura, and Michio Hisasue, both of Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Aug. 1, 1980, Ser. No. 174,438
Claims priority, application Japan, Aug. 17, 1979, 54-104054
Int. Cl.[3] C08G *81/02*; C08L *53/00*
U.S. Cl. 525—102 14 Claims

1. Fluorine-containing elastomers comprising a grafted copolymer having rubber-like elasticity and having chemical linkages at the reactive sites of fluorine-containing polymeric segments and organopolysiloxane segments, wherein the fluorine-containing polymeric segments consist of two or more chemically different monomeric units at least one of which being a fluorine-containing olefinic unit, said siloxane segments containing amino groups reactive sites.

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4,314,044

## PROCESS FOR PREPARING LOW MOLECULAR WEIGHT WATER-SOLUBLE POLYMERS

Kathleen A. Hughes, Plymouth Meeting; Benjamin B. Kine, Elkins Park, and Graham Swift, Blue Bell, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 4,974, Jan. 22, 1979, abandoned. This application May 21, 1980, Ser. No. 152,011
Int. Cl.[3] C08F *4/40, 2/16*
U.S. Cl. 260—29.6 M 16 Claims

1. A process for preparing a water-soluble polymer having a weight average molecular weight of from about 2,500 to 50,000 comprising reacting, under an ambient atmosphere and in an aqueous solution system wherein there is present from about 0.1 to about 1.5 parts by weight of water for each part, by weight, of monomer, said reaction conducted at a temperature up to the boiling point of said system, from about 40% to about 60%, by weight, based on the total weight of the reaction solution, of a water-soluble monomer selected from the class consisting of (a) acrylic acid, methacrylic acid, acrylamide, methacrylamide and mixtures thereof, and (b) water-soluble comonomers of one or more of the monomers of (a) with from about 5 to 50% by weight of the total monomers present of a comonomer selected from the class consisting of itaconic acid, maleic acid, fumaric acid, hydroxyethylmethacrylate, hydroxypropylmethacrylate, hydroxyethylacrylate, hydroxypropylacrylate, acrylonitrile, methacrylonitrile, dimethylaminoethyl acrylate, dimethylaminoethyl methacrylate, t-butylaminoethyl acrylate, 4-vinyl pyridine, betahydroxyethyldimethylaminoethyl methacrylate salt, t-butylaminoethyl methacrylate, and mixtures thereof in the presence of a catalyst system consisting essentially of a water-soluble initiator, a tertiary amine in a molar ratio of up to about 1 of amine to 10 of catalyst initiator, and at least one metal salt selected from the class consisting of water-soluble salts of (1) copper, iron, manganese, cobalt, chromium, silver, gold, titanium, lead and cerium and (2) one or more metal salts of (1) with metal salts of zinc or calcium, and wherein the molar ratio of said initiator to metal ion is from 10 to 1 to 150 to 1 and said initiator is present in an amount of from about 0.5 weight percent to about 35 weight percent based on the weight of monomer present.

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4,314,045

## POLYMERIZATION PROCESS FOR CIS-1,4-POLYBUTADIENE USING ALIPHATIC SOLVENTS AND AN AROMATIC POLYMERIZATION REGULATOR

Joseph Odar, South Euclid, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 960,388, Nov. 13, 1978, Pat. No. 4,224,426. This application Jun. 12, 1980, Ser. No. 158,969
Int. Cl.[3] C08F *2/06, 36/06*
U.S. Cl. 526—93 11 Claims

1. An improved process of polymerizing butadiene-1,3 to produce primarily linear, gel-free cis-1,4-polybutadiene which is carried out in the presence of a catalyst comprising a cobalt compound, at least one organoaluminum compound and water, the improvement which comprises carrying out the polymerization reaction in a cycloalkane having 5 to 8 carbon atoms and from 0.1 to 2 percent based on the weight of total charge, of tetramethyl or pentamethylbenzene.

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4,314,046

## PROCESS FOR THE STEREOREGULAR POLYMERIZATION OF α-OLEFINS IN THE PRESENCE OF A SUPPORTED TITANIUM CATALYST

Hiroshi Ueno, Namekawa; Masafumi Imai; Naomi Inaba, both of Ooi; Makoto Yoda, Kawagoe, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 29,081, Apr. 11, 1979, Pat. No. 4,242,230. This application Jul. 28, 1980, Ser. No. 172,797
Claims priority, application Japan, Apr. 12, 1978, 53-42147
Int. Cl.[3] C08F *4/64*
U.S. Cl. 526—125 8 Claims

1. In a process for the stereoregular polymerization of α-olefins, wherein an α-olefin is contacted, under α-olefin (co)-polymerization conditions, with a catalyst system comprising a titanium catalyst component and an organo aluminum catalyst component prepared by mixing an organo aluminum compound and an organic acid ester, the improvement comprising:

the titanium catalyst component being obtained by co-grinding, in combination, a magnesium halide, a tetravalent titanium halide, and a carboxylic acid ester to obtain a titanium-containing solid product;

treating said titanium-containing solid product by contacting at a temperature in the range of from about 40° C. to about 200° C. for about 0.5 to about 20 hours with a compound selected from one of a hydrocarbon which is present in an amount of from 5 to 50 times the weight of the titanium-containing solid and an organohalogen compound which is one of a halogen-substituted aliphatic, alicyclic and aromatic hydrocarbon having from 1 to 20 carbon atoms and is present in an amount of from about 0.5 to 50 times the weight of the titanium-containing solid.

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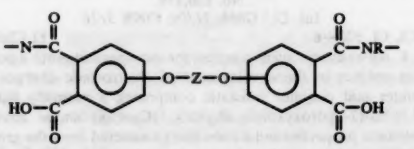
4,314,047

## PARTICULATED POLYETHERIMIDE AND METHOD FOR MAKING

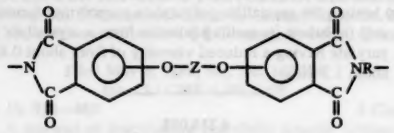
Eugene G. Banucci, Scotia, and Edith M. Boldebuck, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 37,437, May 9, 1979, abandoned. This application Jul. 21, 1980, Ser. No. 170,763
Int. Cl.[3] C08G *69/28, 69/30, 73/10*
U.S. Cl. 528—26 1 Claim

1. A method for making particulated substantially organic solvent-free polyetherimide which comprises heating particulated substantially organic solvent-free polyetheramide acid consisting essentially of chemically combined units of the formula,

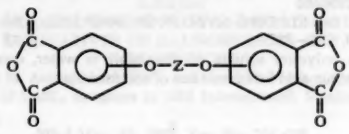


at a temperature in the range of from 135° C. to 175° C. until the resulting particulated product consists essentially of at least about 70 mole percent of chemically combined imide units of the formula,

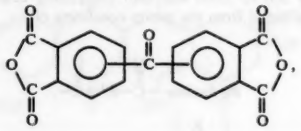


based on the total moles of chemically combined imide and amide acid units without a substantial degree of sintering occurring in the resulting particulated product, where the polyetheramide acid is the product of reaction of organic dianhydride and organic diamine utilized in a mole ratio of 1 mole of organic dianhydride, per 1 to 1.5 mole of organic diamine, where the organic dianhydride is selected from the group consisting of

(A) aromatic bis(ether anhydride)s of the formula,



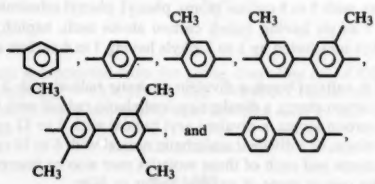
(B) mixtures of 1 or more of said bis(ether anhydride)s with up to 30 mole percent of benzophenone dianhydride of the formula,



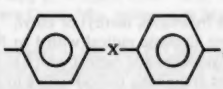
with at least one organic diamine of the formula,

$H_2N—R—NH_2$,

where said polyetheramide acid reaction product has a number average molecular weight of below about 5000, where Z is a member selected from



and divalent organic radicals of the general formula,

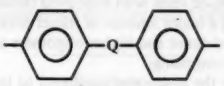


X is a member selected from the class consisting of divalent radicals of the formulas

$—C_yH_{2y}—$, —C—,

—O—, and —S—,

y is an integer from 1 to 5, and R is a divalent organic radical selected from the class consisting of aromatic hydrocarbon radicals having from 6 to about 20 carbon atoms and halogenated derivatives thereof, alkylene radicals having from 2 to about 20 carbon atoms, from $C_2$ to about $C_8$ alkylene terminated polydiorganosiloxane and divalent radicals of the general formula,



Q is a member selected from the class consisting of —O—, —S—, and $—C_2H_{2x}—$, where x is an integer from 1 to 5.

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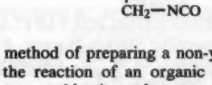
**4,314,048**

## ALIPHATIC TRIISOCYANATE, A METHOD FOR PREPARING IT AND THE PREPARATION OF POLYURETHANE RESINS THEREWITH

**Tsunesuke Doi, Tama; Akira Ide, Nobeoka, and Yasushi Kishimoto, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan**

**Filed Feb. 20, 1981, Ser. No. 236,544**
**Claims priority, application Japan, Mar. 11, 1980, 55-29751**
**Int. Cl.³ C08G *18/00*; C07C *119/042***
**U.S. Cl. 528—44** **5 Claims**

1. 4-Isocyanate methyl-1,8-octamethylene diisocyanate of the formula (I),



(I)

4. In a method of preparing a non-yellowing polyurethane resin by the reaction of an organic polyisocyanate and an organic compound having at least two reactive hydrogen-containing groups as determined by the Zerewitinoff method, the improvement which comprises employing 4-isocyanate methyl-1,8-octamethylene diisocyanate of claim 1 as the polyisocyanate.

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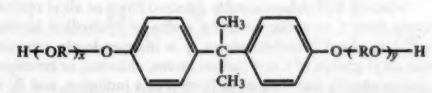
**4,314,049**

## POLYESTER RESIN COMPOSITION

**Shinichiro Yasuda, Wakayama, Japan, assignor to Kao Soap Co., Ltd., Tokyo, Japan**

**Filed Mar. 14, 1980, Ser. No. 130,302**
**Int. Cl.³ C08G *63/18***
**U.S. Cl. 528—128** **6 Claims**

1. A polyester resin composition produced by a reaction of:
(A) a dicarboxylic acid,
(B) a polyol comprising an etherified diphenol of the formula:



in which R is an alkylene having 2 or 3 carbon atoms; and x and y are each a positive integer with the proviso that the average sum of x plus y is from 2 to 7, and

(C) from about 0.05 to about 10 mol %, based on the polyol (B), of a compound having, in the molecule, one or two phenolic hydroxy groups and either (i) an alcoholic hydroxy group or (ii) a carboxy group.

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**4,314,050**

## METHOD OF PREPARING A PHENOLIC ALDEHYDE RESIN AND RESIN COMPOSITION FOR AN ADHESIVE SYSTEM TO BE APPLIED TO GLASS FIBERS

**Mikhail M. Girgis, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Oct. 30, 1978, Ser. No. 956,473**
**Int. Cl.³ C08G *8/22***
**U.S. Cl. 528—140** **5 Claims**

1. A method for preparing a thermoplastic, water soluble, resorcinol aldehyde resin with improved flexibility and toughness and having a major amount of trimer polymer with only a minor amount of dimer and higher oligomers and having slight cross-linking, comprising:

a. reacting in the absence of methanol to less than 100 percent completion a resorcinol and an aldehyde in an amount of resorcinol to aldehyde in mole ratios in the range of 0.6 to about 2 at a pH in the range of about 3.5 to about 5.5 to limit formation of resorcinol alcohols for a period of time equivalent to the period of time in the range of about 1 hour to about 20 hours at a temperature in the range of about 30° F. (−1.1° C.) to about 122° F. (50° C.) to produce a resinous mixture containing predominantly trimer polymer with smaller amounts of dimer polymer and higher oligomer polymer along with unreacted resorcinol and unreacted aldehyde, and,

b. continuing the reaction of the resorcinol and aldehyde and reaction mixture at a pH maintained in the range of above 7 to about 7.5 at a temperature in the range of about 50° F. (10° C.) to about 140° F. (60° C.) when the residence time is in the range of about 0.75 to about 20 hours to produce the flexible but tough resin mixture having a predominant amount of trimer polymer and having slight cross-linking.

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**4,314,051**

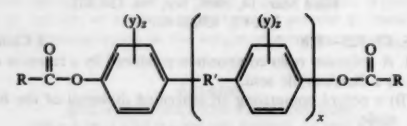
## PROCESS FOR PREPARING POLYARYLATES

**Mitchell H. Berger, Somerville; Markus Matzner, Edison, and James M. Tibbitt, Lebanon, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed May 5, 1980, Ser. No. 146,210**
**Int. Cl.³ C08G *63/00***
**U.S. Cl. 528—179** **15 Claims**

1. A process for preparing crystalline polyarylates which comprises

(a) forming a crystalline polyarylate prepolymer having a reduced viscosity of from 0.05 to about 0.4 dl/g by reacting at least one diester derivative of a dihydric phenol having the following formula:



wherein R is independently selected from an alkyl radical having from 1 to about 6 carbon atoms or cycloalkyl having from 4 to about 7 carbon atoms, y is independently selected from alkyl groups of 1 to 4 carbon atoms, chlorine, or bromine, z independently has a value of from 0 to 4 inclusive, and R′ is independently selected from a divalent saturated aliphatic hydrocarbon radical having 1 to 8 carbon atoms, a cycloalkylene or cycloalkylidene radical having up to and including 9 carbon atoms, O, S, SO, $SO_2$, CO, x is 0 or 1; with at least one aromatic dicarboxylic acid in the presence of a solvent at a temperature of from about 250 to about 300° C.; and

(b) heating the crystalline polyarylate prepolymer formed in step (a) below its melting point to form a crystalline polyarylate having a reduced viscosity of from about 0.45 to about 1.2 dl/g.

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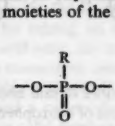
**4,314,052**

## POLYESTER WHICH IS SOLUBLE OR DISPERSIBLE IN WATER, A PROCESS FOR ITS PREPARATION AND ITS USE AS A LEVELLING AUXILIARY, LEVELLING AUXILIARIES AND PROCESSES FOR UNIFORM DYEING

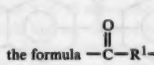
**Friedrich Engelhardt; Karl Hintermeier, both of Frankfurt am Main; Joachim Ribka, Offenbach am Main-Bürgel; Walter Dürsch, and Walter Rupp, both of Königstein, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main Fechenheim, Fed. Rep. of Germany**

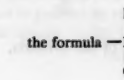
**Filed Jan. 7, 1980, Ser. No. 110,343**
**Claims priority, application Fed. Rep. of Germany, Jan. 10, 1979, 2900686**
**Int. Cl.³ C08G *63/68, 79/04;* D06P *1/52, 1/60***
**U.S. Cl. 528—287** **15 Claims**

1. A polyester soluble or dispersible in water, containing phosphonic acid ester moieties of the formula



with the polyester having an apparent average molecular weight of 800 to 5,000 and also comprising chain member moieties selected from the group consisting of

the formula  ,

the formula  , the formula $-O-R^4-O$,

wherein R is hydrogen, an aliphatic moiety with 1 to 22 carbon atoms which may also be interrupted by one or more oxygen atoms, phenyl substituted aliphatic moiety having 1 to 12 carbon atoms in the aliphatic portion and which also may be interrupted by one or more oxygen atoms, a cycloaliphatic moiety with 5 to 8 carbon atoms, phenyl, phenyl substituted by 1 to 3 alkyls having 1 to 6 carbon atoms each, naphthyl, or napthyl substituted by 1 to 3 alkyls having 1 to 6 carbon atoms each;

$R^1$ is a direct bond, a divalent aliphatic radical with 2 to 10 carbon atoms, a divalent cycloaliphatic radical with 6 to 8 carbon atoms, a divalent aryl radical with 6 to 12 carbon atoms, or a divalent araliphatic radical with 6 to 14 carbon atoms and each of those moieties may also be interrupted by one or more of oxygen, sulfur or $SO_2$;

$R^4$ is a divalent aliphatic, cycloaliphatic or araliphatic moiety whose carbon skeleton may also be interrupted by oxygen, phenylene, naphthylene or $-C_6H_5-SO_2-C_6H_5-$;

$R^5$ and $R^6$ are hydrogen, methyl or ethyl;

$R^7$ is a divalent aliphatic radical with 1 to 10 carbon atoms, a divalent cycloaliphatic radical with 6 to 11 carbon atoms or a divalent araliphatic radical with 8 to 12 carbon atoms and each may also be interrupted by oxygen;

s and z is each a number from 1 to 20;

p is a number from 1 to 10 and

q and k are each 0, 1, 2 or 3.

4,314,053

## PROCESS FOR REDUCING POLYOLEFIN DIE SMOKE

Chi-Hung Lin, Wheaton, and Linus K. Leung, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 8, 1980, Ser. No. 147,838
Int. Cl.³ C08F 6/00, 6/08
U.S. Cl. 528—483 4 Claims

1. A method of deactivating polyolefin powder containing active catalyst comprising (1) contacting said polymer with an inert gas containing about 4 to about 10 weight percent water vapor for about 10 to 90 minutes at a temperature between about 180° F. and about 10° F. below the softening point of the polymer, and (2) then contacting such powder with an inert gas containing about 4 to about 10 weight percent water vapor and about 0.05 to about 6 volume percent oxygen for about 10 to about 120 minutes at a temperature between about 180° F. and about 10° F. below the softening point of the polymer in a fluidized bed.

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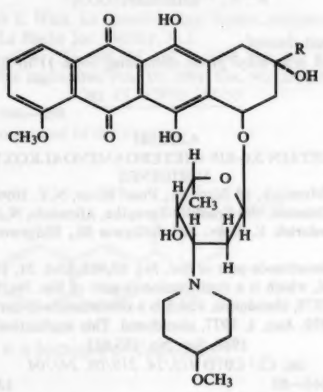
4,314,054

## 3'-DEAMINO-3'-(4-METHOXY-1-PIPERIDINYL) DERIVATIVES OF DAUNORUBICIN AND DOXORUBICIN

Edward M. Acton, Menlo Park, and Carol W. Mosher, Stanford, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Mar. 23, 1981, Ser. No. 246,625
Int. Cl.³ A61K 31/70; C07H 15/24
U.S. Cl. 536—17 A 7 Claims

1. Compounds of the formula



wherein R is selected from the group consisting of —$COCH_3$, —$CHOHCH_3$, —$COCH_2OH$ and —$CHOHCH_2OH$ and the pharmaceutically acceptable acid addition salts of said compounds.

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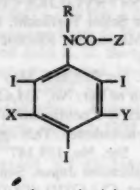
4,314,055

## 3,5-DISUBSTITUTED-2,4,6-TRIIODOANILIDES OF POLYHYDROXY-MONOBASIC ACIDS

George B. Hoey, Ferguson; George P. Murphy, Creve Coeur, both of Mo.; Philip E. Wiegert, Glens Falls, N.Y., and James W. Woods, Creve Coeur, Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 617,081, Sep. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 519,115, Oct. 30, 1974, abandoned. This application Mar. 29, 1977, Ser. No. 782,421
Int. Cl.³ A61K 49/04; C07H 3/00; C07C 103/78
U.S. Cl. 536—53 18 Claims

1. A compound of the formula:



wherein X and Y are each non-ionizing functions compatible with water solubility and/or low toxicity in the 2,4,6-triiodophenyl configuration, R is selected from the group consisting of hydrogen, lower alkyl and hydroxy-lower alkyl and CO—Z is the acyl residue of a polyhydroxy-monobasic acid, said acyl residue containing not more than 8 carbon atoms in its chain or ring.

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4,314,056

## CATALYST FOR AND METHOD OF PREPARING CELLULOSE ESTERS

Richard J. Brewer, and Brice S. Wininger, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1980, Ser. No. 182,516
Int. Cl.³ C08B 3/00
U.S. Cl. 536—63 6 Claims

1. A method of preparing lower fatty acid esters of cellulose which comprises esterifying at a temperature of between about 75° C. and about 110° C. a cellulose compound having esterifiable hydroxyl groups with an esterifying bath comprising an organic acid anhydride, a diluent, and from 0.3 to 0.8% by weight based on the weight of cellulose of a catalyst comprising (a) from about 25 to about 75% by weight of sulfuric acid and (b) from about 75% to about 25% by weight of phosphoric acid, the weight ratio of said bath to the cellulose being between about 5:1 and about 10:1.

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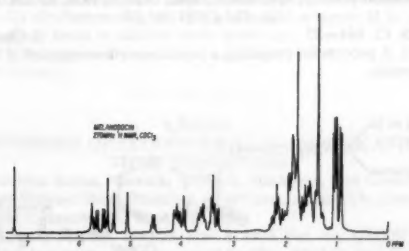
4,314,057

## ACANTHIFOLIC ACID-NEW ANTITUMOR AND ANTIBIOTIC AGENT

Francis J. Schmitz; Dick van der Helm; M. Bilayet Hossain; Yalamanchili Gopichand, all of Norman, Okla., and Ravi S. Prasad, Riverdale, Md., assignors to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 170,927, Jul. 21, 1980. This application Sep. 15, 1980, Ser. No. 187,066
The portion of the term of this patent subsequent to Nov. 24, 1998, has been disclaimed.
Int. Cl.³ C07D 407/14
U.S. Cl. 542—401 3 Claims



1. A purified, cytotoxic compound named melanodocin which melts with decomposition and gas evolution at 164°–166° C.; has a specific rotation $[\alpha]_D^{25}$ of 25.4 (C 0.24, $CHCl_3$); and exhibits the infrared spectrum and 270 $MH_z$ $^1H$ NMR spectrum as shown in FIGS. 4 and 5.

## 4,314,058
## INDOLINS STYRYL-LIKE COMPOUNDS

**Masaaki Hayami, and Seiko Torikoshi, both of Okayama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka Pref., Japan**

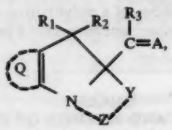
**Continuation of Ser. No. 921,095, May 2, 1978, abandoned, which is a continuation of Ser. No. 734,626, Oct. 21, 1976, Pat. No. 4,147,862, which is a continuation-in-part of Ser. No. 611,834, Sep. 9, 1975, abandoned. This application Feb. 6, 1980, Ser. No. 119,147**

**Claims priority, application Japan, Sep. 18, 1974, 49/108090**

**Int. Cl.³ C07D *498/04***

**U.S. Cl. 542—455** **40 Claims**

1. A compound of the formula



(I)

wherein

Q is aryl;

each of $R_1$ and $R_2$ is lower alkyl, hydroxyl alkyl, or alkoxyalkyl;

$R_3$ is hydrogen, alkyl, alkoxy, halogen, cyano, aryl, or phenoxy;

Y is oxygen or sulfur;

Z is alkylene of 2 to 4 carbon atoms unsubstituted or substituted by alkyl;

A is a condensation reaction residue of a compound selected from the group consisting of an aryl aldehyde, a nitroso aryl, a heterocyclic aldehyde compound, and a nitroso indole,

said aryl aldehyde and said nitroso aryl being free of a hydroxy or a derivative of hydroxy ortho to the carbon atom bonded to said C═ and said heterocyclic moiety being selected from the group consisting of indole, furan, thiophene, pyridine, carbazole, pyrrole, benzothiazole, benzoselenazole, thiazole, benzopyran quinoline, acridine, and pyrimidine, wherein said heterocyclic moiety is unsubstituted or substituted by alkyl, alkylidene, aryl, or halogen.

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## 4,314,059
## PROCESS FOR PREPARING CEPHALOSPORIN COMPOUNDS

**Chisei Shibuya; Kunihiko Ishii; Takumi Sano, and Torao Ishida, all c/o Asahi Kasei Kogyo Kabushiki Kaisha 2-1, Samejima, Fuji-shi, Shizuoka-ken, Japan**

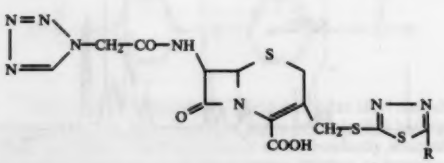
**Division of Ser. No. 18,755, Mar. 8, 1979, Pat. No. 4,258,195. This application Jul. 28, 1980, Ser. No. 172,553**

**Claims priority, application Japan, Mar. 9, 1978, 53-259756**

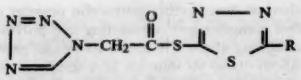
**Int. Cl.³ C07D *501/06***

**U.S. Cl. 544—27** **2 Claims**

1. A process for preparing a cephalosporin compound of the formula,



wherein R is a hydrogen atom or a methyl group, which comprises reacting (a) 7-aminocephalosproanic acid, (b) salts selected from alkali metal, alkaline earth metal, and nitrogen containing organic base salts of 7-aminocephalosporanic acid or (c) toluenesulfonylethyl, benzyl, para-nitrobenzyl, phenacyl, diphenylmethyl, trityl, t-butyl, methyl, acetyloxymethyl, 3, 5-di(t-butyl)-4-hydroxybenzyl, and $\beta,\beta,\beta$-trichloroethyl esters of 7-aminocephalosporanic acid, with about 0.5 mole to about 2.0 moles per mole 7-aminocephalosporanic acid or salt or ester thereof of a 1, 3, 4-thiadiazole-5-thiol ester of the formula,



wherein R is a hydrogen atom or a methyl group, in a reaction medium at a temperature of from about −50° C. to about 100° C. and at a pH ranging from about 1 to about 9.

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## 4,314,060
## OXAALKANOATE ANTI-ULCER COMPOUNDS

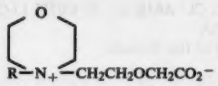
**James P. Brown, and Robert G. Laughlin, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Jul. 16, 1979, Ser. No. 57,923**

**Int. Cl.³ C07D *295/14*; C07C *101/18, 101/12***

**U.S. Cl. 544—171** **10 Claims**

10. Compounds of the formula



or ester salt thereof

wherein R is an alkyl group containing from 11 to 30 carbon atoms.

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## 4,314,061
## CERTAIN 3,6-BIS-(HETEROAMINOALKOXY) ACRIDINES

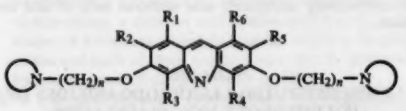
**Keith C. Murdock, 15 Birch St., Pearl River, N.Y. 10965; Martin R. Damiani, 603 Franklin Turnpike, Allendale, N.J. 07401, and Frederick E. Durr, 387 Jefferson St., Ridgewood, N.J. 07450**

**Continuation-in-part of Ser. No. 89,805, Oct. 31, 1979, abandoned, which is a continuation-in-part of Ser. No. 954,279, Oct. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 821,039, Aug. 1, 1977, abandoned. This application Sep. 2, 1980, Ser. No. 183,612**

**Int. Cl.³ C07D *413/14, 219/08, 241/04***

**U.S. Cl. 544—80** **13 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein n is the integer 2, 3 or 4; $R_1$, $R_2$, $R_3$, $R_4$, $R_5$ and $R_6$ are each individually selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, nitro, amino and acetamido; and

is 1-pyrrolidino, 1-piperidino, 1-morpholino or 4-methyl-1-

piperazino; and the pharmacologically acceptable acid-addition salts thereof.

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4,314,062

## PROCESS FOR PRODUCTION OF DICYANOPIPERAZINE

Richard B. Lund, Jackson, Ala., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 15, 1980, Ser. No. 140,535
Int. Cl.³ C07D *295/10*
U.S. Cl. 544—402 8 Claims

1. A process for the preparation of dicyanopiperazine which comprises the steps of adding two moles of a cyanogen halide to each mole of piperazine dissolved in water at a temperature of at least 10° but below about 80° C., maintaining the pH of the mixture during the resulting reaction within the range 6.0 to 9.0 by the addition of an alkali metal hydroxide source; cooling the resulting slurry of dicyanopiperazine in salt water to a temperature below about 10° C. and filtering the dicyanopiperazine from the saline spent reaction medium.

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4,314,063

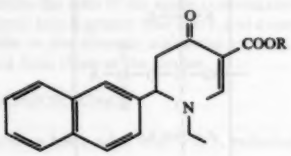
## 1-ETHYL-1,4,5,6-TETRAHYDRO-6-(2-NAPHTHYL)-4-OXO-NICOTINIC ACID AND LOWER ALKYL ESTERS THEREOF

Alexander E. Wick, Le Mesnil-le Roy, France, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 166,506, Jul. 7, 1980, Pat. No. 4,278,798. This application Feb. 19, 1981, Ser. No. 235,870
Int. Cl.³ C07D *213/55*
U.S. Cl. 546—298 3 Claims

1. A compound of the formula

II



wherein R is hydrogen or $C_{1-6}$-alkyl.

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4,314,064

## PROCESS FOR THE PRODUCTION OF NICOTINAMIDE

Helmut Beschke; Heinz Friedrich, both of Hanau; Klaus-Peter Müller, Bergheim, and Gerd Schreyer, Hanau, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 676,198, Apr. 12, 1976, abandoned. This application Sep. 29, 1980, Ser. No. 192,038
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1975, 2517054
Int. Cl.³ C07D *213/56*
U.S. Cl. 546—317 12 Claims

1. A continuous process for the production of nicotinamide from nicotinonitrile comprising hydrolyzing the nicotinonitrile using about 0.3 to 3.0 moles of an alkali metal hydroxide per 100 moles of nicotinonitrile at about 120° to 200° C. at pressures of 3 to 20 bar.

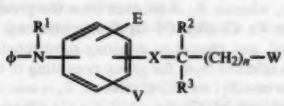
4,314,065

## PHENYLAMINE SUBSTITUTED ON AMINE WITH A BENZO(OXA, THIA OR DI) AZOLE GROUP

Alexander Serban, Doncaster; Keith G. Watson, Box Hill North, both of Australia, and John E. D. Barton, Reading, England, assignors to ICI Australia Limited, Melbourne, Australia

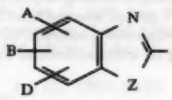
Filed Mar. 17, 1980, Ser. No. 131,389
Claims priority, application Australia, Mar. 19, 1979, PD8094; United Kingdom, Apr. 12, 1979, 13065/79; Australia, May 22, 1979, PD8886
Int. Cl.³ C07D *263/58, 277/82, 235/14;* A01N *43/76*
U.S. Cl. 548—222 6 Claims

1. A compound



or a salt thereof wherein:

$\phi$ is the group



in which Z is chosen from O, S, NH and N–$C_1$ to $C_6$ alkyl;

A, B and D are independently chosen from the group consisting of hydrogen, halogen, nitro, $C_1$ to $C_6$ alkyl, $C_1$ to $C_6$ haloalkyl and $C_1$ to $C_6$ alkoxy;

E and V are independently chosen from the group consisting of hydrogen, halogen and nitro;

$R^1$ is chosen from the group consisting of hydrogen, $C_1$ to $C_6$ alkyl, $C_2$ to $C_6$ alkenyl, $C_2$ to $C_6$ alkynyl, $C_2$ to $C_6$ alkanoyl and benzyl;

$R^2$ and $R^3$ are independently chosen from hydrogen and $C_1$ to $C_6$ alkyl;

W is

wherein: G is chosen from the group consisting of hydroxy, $C_1$ to $C_{10}$ alkoxy, $C_2$ to $C_{10}$ alkenyloxy, $C_2$ to $C_{10}$ alkynyloxy, $C_3$ to $C_7$ cycloalkoxy, benzyloxy, $C_1$ to $C_{10}$ alkylthio, amino, N-($C_1$ to $C_6$ alkyl)amino, N,N-di($C_1$ to $C_6$ alkyl)amino, $C_1$ to $C_{10}$ alkoxy substituted with a substituent chosen from amino, ammonio, N-($C_1$ to $C_6$ alkyl-)amino, N,N-di($C_1$ to $C_6$ alkyl)amino and N,N,N-tri($C_1$ to $C_6$ alkyl)ammonio, and the group OM wherein M is an alkali metal or alkaline earth metal ion;

X is oxygen; and

n is 0 or 2.

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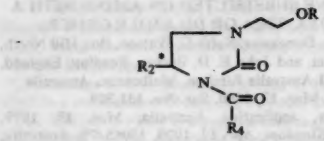
4,314,066

## SYNTHESIS OF TETRAMISOLE, LEVAMISOLE AND THEIR DERIVATIVES

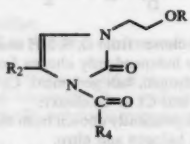
Sivaraman Raghu, Norwalk; Arthur K. Hoffmann, New Canaan, and Balwant Singh, Stamford, all of Conn., assignors to American Cyanamid Co., Stamford, Conn.

Division of Ser. No. 739,923, Nov. 8, 1976, Pat. No. 4,087,611, which is a continuation-in-part of Ser. No. 680,302, Apr. 26, 1976, abandoned. This application Feb. 15, 1978, Ser. No. 878,049
Int. Cl.³ C07D *233/38*
U.S. Cl. 548—320 5 Claims

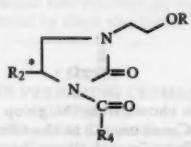
1. A method for the preparation of an optically active compound of the formula:



wherein R is selected from the group consisting of hydrogen, $C_1$–$C_6$ alkyl, halo $C_1$–$C_6$ alkyl, phenyl, phenyl substituted with up to three groups selected from the group consisting of $C_1$–$C_6$ alkyl, halo and $C_1$–$C_6$ alkoxy and a moiety of the formula $COR_3$, wherein $R_3$ is selected from the group consisting of hydrogen, $C_1$–$C_6$ alkyl $C_1$–$C_6$ alkoxy, phenoxy, halo $C_1$–$C_6$ alkyl, phenyl, and phenyl or phenoxy substituted with up to four groups selected from the group consisting of $C_1$–$C_6$ alkyl, halo, trifluoromethyl and $C_1$–$C_6$ alkoxy; $R_4$ is selected from the group consisting of $C_1$–$C_6$ alkyl $C_1$–$C_6$ alkoxy, phenoxy, $C_5$–$C_{10}$ cycloalkyl, phenyl, and phenyl or phenoxy substituted with up to four groups selected from the group consisting of $C_1$–$C_6$ alkyl, halo, trifluoromethyl and $C_1$–$C_6$ alkoxy; and $R_2$ is selected from the group consisting of phenyl and phenyl substituted with up to two groups selected from the group consisting of $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkoxy, halo and trifluoromethyl which comprises reducing an imidazolinone of formula:



wherein R, $R_4$ and $R_3$ are as previously defined, by hydrogenating in the presence of a chiral catalyst in a suitable organic solvent at a temperature from about 25° to 80° C. to obtain an optically active imidazolidone of formula:



wherein R, $R_4$ and $R_2$ are as previously defined.

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**4,314,067**

**MONOMERIC COMPOUNDS HAVING VINYL AND IMIDAZOLIDIN-2-ONE TERMINAL GROUPS**

**Frederick L. Herman, Allentown, and Dale D. Dixon, Kutztown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**

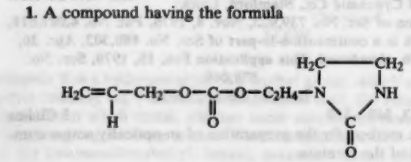
**Continuation-in-part of Ser. No. 709,677, Jul. 29, 1976, Pat. No. 4,111,877. This application Mar. 6, 1978, Ser. No. 883,554**

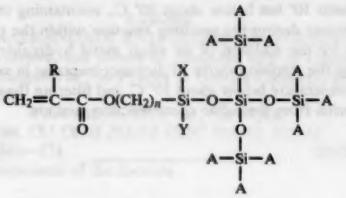
**The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.**

**Int. Cl.³ C07D *233/36, 233/34***

**U.S. Cl. 548—320** **3 Claims**

1. A compound having the formula





wherein R is selected from the class consisting of lower alkyl groups and hydrogen, and n is an integer from one to three, wherein X and Y are selected from the class consisting of lower alkyl groups, cycloalkyl groups, phenyl groups (substituted and unsubstituted), polysiloxanyl groups, flourine and Z groups; Z is a group of the structure:

and wherein A is selected from the class consisting of lower alkyl groups and phenyl groups.

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**4,314,068**

**OXYGEN-PERMEABLE CONTACT LENS COMPOSITIONS, METHODS, AND ARTICLES OF MANUFACTURE**

**Nick N. Novicky, Wheeling, Ill., assignor to George F. Tsuetaki, Chicago, Ill.**

**Division of Ser. No. 6,725, Jan. 26, 1979, Pat. No. 4,216,303. This application Jul. 28, 1980, Ser. No. 172,839**

**Int. Cl.³ C07F *7/08, 7/18***

**U.S. Cl. 556—440** **7 Claims**

1. A new composition especially adapted for making oxygen-permeable polymers used in the production of contact lenses, said composition having the structure:

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**4,314,069**

**HERBICIDAL COMPOUND, HERBICIDAL COMPOSITION CONTAINING THE SAME, AND METHOD OF USE THEREOF**

**Ryohei Takahashi, Kusatsu; Kanichi Fujikawa, Kyoto; Isao Yokomichi, Kusatsu; Sinzo Someya, Kusatsu, and Nobuyuki Sakashita, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan**

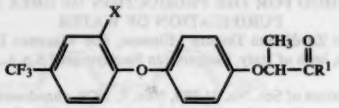
**Division of Ser. No. 596,784, Jul. 17, 1975. This application Apr. 15, 1977, Ser. No. 788,043**

**Claims priority, application Japan, Jul. 17, 1974, 49-82403; Jul. 17, 1974, 49-82404; Oct. 14, 1974, 49-117047**

**Int. Cl.³ C07C *69/76***

**U.S. Cl. 560—62** **7 Claims**

1. A compound having the formula:



wherein X is a hydrogen atom or a chlorine atom, and $R^1$ is an allyloxy group or a 2-propynyloxy group.

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4,314,070

## PROCESS FOR PRODUCING META-PHENOXYBENZOIC ACIDS AND ESTERS

Fred G. Schreiber, Highland Park, and Peter S. Gradeff, Pottersville, both of N.J., assignors to Rhone-Poulenc Inc., Monmouth Junction, N.J.

Filed May 14, 1980, Ser. No. 149,588
Int. Cl.³ C07C 69/92
U.S. Cl. 560—64 13 Claims

1. A process for producing meta-phenoxybenzoic acids and their lower alkyl esters, which comprises reacting an alkali-metal phenate with a lower alkyl ester of meta-halobenzoic acid in the presence of a copper sulfate catalyst.

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4,314,071

## METHOD OF PREPARING MONOESTERS

James H. Babler, 125 Callan Ave., Evanston, Ill. 60202

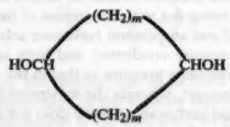
Continuation-in-part of Ser. No. 954,363, Oct. 25, 1978, abandoned. This application May 12, 1980, Ser. No. 148,922
Int. Cl.³ C07C 69/75
U.S. Cl. 560—127 10 Claims

1. A method of preparing a monoester which comprises:
preparing a reaction mixture selected from the group consisting of

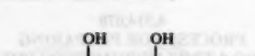
(a) an alkanoic acid selected from the group consisting of formic and acetic, an acid catalyst, water in an amount whereby the ratio of the molar concentration of water to alkanoic acid is greater than 3 to 1, and a symmetrical diol soluble in the alkanoic acid-water mixture, said diol selected from those of the forulae

$$HOCH_2(CH_2)_nCH_2OH$$

wherein n has a value from 0 to 5, inclusive,

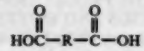


wherein m has a value of 1 or 2,



wherein x has a value of 0 or 1, y has a value of from 0 to 3, and $(2x+y)<4$;

(b) an alcohol selected from the group consisting of methanol and ethanol, an acid catalyst, water in an amount whereby the ratio of the molar concentration of water to alcohol is at least 3 to 1, and a symmetrical dicarboxylic acid soluble in the alcohol-water mixture, said acid selected from the group consisting of diacids of the formula



wherein R represents a chemical bond or a straight chain alkylene having up to 5 carbons;

continuously extracting the reaction mixture with a nonpolar solvent which is essentially insoluble in the reaction mixture and in which the reactants have no more than slight solubility, to form a monoester of the reactants of (a) or (b), soluble in the nonpolar solvent,

separating the nonpolar solvent containing the monoester from the reaction mixture, and

isolating the monoester from the nonpolar solvent.

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4,314,072

## 2-[2-(2,2-DIHALOVINYL)-3,3-DIMETHYLCYCLOPROPYL]ETHYLIDENE DIACETATES

Johannes L. M. Syrier, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 55,854, Jul. 9, 1979, abandoned. This application Nov. 23, 1979, Ser. No. 96,868
Claims priority, application United Kingdom, Jul. 19, 1978, 30335/78; Jul. 19, 1978, 30336/78; Jul. 19, 1978, 30339/78; Jul. 19, 1978, 30373/78
Int. Cl.³ C07C 69/16
U.S. Cl. 560—231 2 Claims

1. A (1R,cis) 2-[2-(2,2-dihalovinyl)-3,3-dimethylcyclopropyl]ethylidene diacetate wherein each halo is independently chloro, fluoro or bromo.

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4,314,073

## PROCESS FOR THE PRODUCTION OF AN AROMATIC DICARBOXYLIC ACID

Graham R. Crooks, Guisborough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jun. 20, 1980, Ser. No. 161,560
Claims priority, application United Kingdom, Jul. 2, 1979, 22989/79
Int. Cl.³ C07C 51/56, 51/42
U.S. Cl. 562—416 10 Claims

1. In a process for the production of an aromatic carboxylic acid which comprises oxidising with molecular oxygen in a primary oxidation stage an aromatic compound substituted by at least one alkyl, hydroxyalkyl or formyl group in a solvent in the presence of a heavy metal oxidation catalyst optionally in conjunction with an oxidation promoter to produce a slurry of said aromatic carboxylic acid in said solvent the improvement in which fresh solvent and molecular oxygen are added to said slurry after the primary oxidation stage but before the separation of the aromatic carboxylic acid from the slurry mother liquor.

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4,314,074

## PROCESS FOR PRODUCING METHACRYLIC ACID

Sargis Khoobiar, Kinnelon, N.J., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 972,743, Dec. 26, 1978, Pat. No. 4,252,681. This application Oct. 14, 1980, Ser. No. 196,805
Int. Cl.³ C07C 51/25, 57/055
U.S. Cl. 562—535 1 Claim

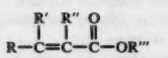
1. A process for the preparation of methacrylic acid which comprises oxidizing methacrolein in the vapor-phase with molecular oxygen in the presence of a catalyst composition having the formula $Mo_aCu_bP_cSb_dCa_eW_fAs_gO_h$ where: a=12; b=0.05–3; c=0.1–5; d=0.01–3; e=0.1–6; f=0.01–3; g=0–3; and h=value determined by the valence and proportions of the other elements of the formula.

## 4,314,075
## PROCESS FOR THE PRODUCTION OF OLEFINIC ACIDS AND ESTERS

Wilfrid G. Shaw, Lyndhurst; Philip L. Kuch, Aurora, and Christos Paparizos, Willowick, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

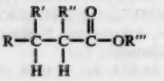
Filed Sep. 5, 1980, Ser. No. 184,592
Int. Cl.³ C07C *51/377, 57/05, 67/317, 69/54*
U.S. Cl. 562—599 12 Claims

1. A vapor-phase process for the production of a compound of the formula



(III)

the process comprising contacting in the presence of molecular oxygen a compound of the formula



(II)

where R–R''' are independently hydrogen or a $C_1$–$C_4$ alkyl radical, with a catalytic amount of a catalyst of the formula

$$Mo_{12}P_{0.1\text{-}3}M_{0.1\text{-}3}Cu_{0.1\text{-}2}V_{0.1\text{-}2}X_{0.01\text{-}2}M'_aO_b \quad (I)$$

where

M is at least one of K, Rb and Cs;

X is at least one of Ba, La, Ga, Al, Ag, Cd, Ti, Tl, Hg, Pb and Zn;

M' is at least one of Fe, Co, Ni, Sr, Mn, In, Ta, Ge, S and Be when $a>0$;

a is a number of 0 to about 2; and

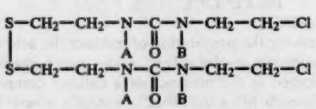
b is a number that satisfies the valence requirements of the other elements present.

## 4,314,076
## CYSTAMINE DERIVATIVES SUITABLE FOR USE AS MEDICAMENTS

Joël Oiry, and Jean-Louis Imbach, both of Montpellier, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly s., Seine, France

Filed Jun. 17, 1980, Ser. No. 160,183
Claims priority, application France, Jun. 19, 1979, 79 15672
Int. Cl.³ C07C *127/15;* A61K *31/17*
U.S. Cl. 564—33 2 Claims

1. Compounds corresponding to the following formula



(I)

in which one of the substituents A and B is hydrogen and the other the radical —N=O.

## 4,314,077
## METHOD FOR THE PRODUCTION OF UREA AND PURIFICATION OF WATER

Umberto Zardi, San Donato Milanese, and Vincenzo Lagana', Milan, both of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Continuation of Ser. No. 91,988, Nov. 7, 1979, abandoned, which is a continuation of Ser. No. 823,872, Aug. 11, 1977, abandoned.
This application Dec. 15, 1980, Ser. No. 216,303
Claims priority, application Italy, Sep. 9, 1976, 27024 A/76
Int. Cl.³ C07C *126/02*
U.S. Cl. 564—70 2 Claims

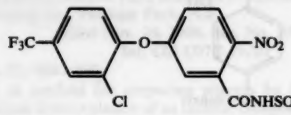
1. In a method for the production of urea and purification of the waters obtained therefrom, comprising feeding to a synthesizing reactor of urea under high pressure liquid ammonia in excess over the stoichiometric amount and carbon dioxide so as to produce a urea solution containing ammonium carbamate, decomposing in a decomposer substantially under the same pressure as the synthesizing pressure (high-pressure decomposer) the carbamate contained in the solution of urea into ammonia and carbon dioxide by using an inert stripping agent which contains oxygen, condensing in a condenser substantially under the same pressure as the synthesis (high-pressure condenser) said ammonia and carbon dioxide and recycling the condensate to the synthesis, discharging from the decomposer a solution of urea which still contains carbamate and dissolved ammonia, sending such solution of urea from the high-pressure decomposer to a medium-pressure decomposer having a lower pressure than that in the high pressure decomposer, the gaseous products discharged from the latter conveyed to a medium-pressure condenser wherein said products are separated into a liquid phase formed of ammonium carbonate and a liquid phase formed of substantially pure ammonia, said liquid phase composed of ammonium carbonate being recycled to the high-pressure condenser and said liquid phase composed of substantially pure ammonia being sent to the synthesis, sending the urea solution emerging from the medium-pressure decomposer to a low-pressure decomposer having a lower pressure than that in the medium pressure decomposer from which there are obtained as head product ammonia, carbon dioxide and water which are condensed in a low-pressure condenser at a pressure no greater than the pressure in the low pressure decomposer, and as tail product a solution of urea which still contains ammonia and carbon dioxide, sending the aqueous urea solution emerging from the low-pressure decomposer to a vacuum concentrator to obtain melted urea and water vapor with ammonia and carbon dioxide which are condensed, the improvements which comprise operating said medium-pressure condenser and low-pressure condenser free of any liquid, both said condensers being fed with the vapors of the decomposers upstream thereof and ammonium carbonate solutions obtained from said low pressure condenser, and both said condensers are operated at the same pressure as that in the corresponding preceding decomposer, wherein the maximum weight ratio of said vapors to said carbonate solution does not exceed 2.5 and the coolant medium has a minimum temperature of 30° C.

## 4,314,078
## PROCESS FOR PREPARING 5-(2-CHLORO-4-TRIFLUOROMETHYLPHENOXY)-2-NITRO-N-ALKANESULPHONYL BENZAMIDES FROM A BENZOIC ACID DERIVATIVE AND INTERMEDIATES

Walter M. Kruse, Wilmington, Del., and John F. Stephen, West Chester, Pa., assignors to ICI Americas Inc., Wilmington, Del.

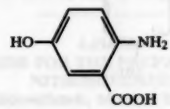
Filed Apr. 2, 1981, Ser. No. 250,205
Int. Cl.³ C07C *102/04, 103/76*
U.S. Cl. 564—99 8 Claims

1. A method of preparing a 5-(2-chloro-4-trifluoromethylphenoxy)-2-nitro-N-alkanesulphonyl benzamide of the following formula (I):



(I)

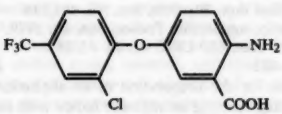
, wherein $R^1$ is an alkyl group of about 1 to 12 carbons, from 2-amino-5-hydroxybenzoic acid of the following formula (II):



(II)

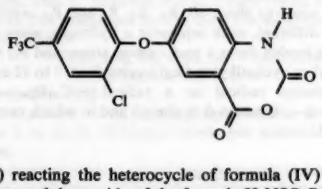
which comprises

(i) reacting the acid of formula (II) with 3,4-dichlorobenzotrifluoride to produce the ether of the following formula (III):



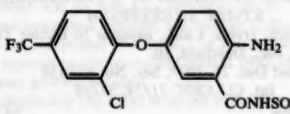
(III)

(ii) reacting the ether of formula (III) with an acylating agent to produce the heterocycle of the following formula (IV):



(IV)

(iii) reacting the heterocycle of formula (IV) with an alkanesulphonamide of the formula $H_2NSO_2R^1$ to produce the sulphonamide of the following formula (V):



(V)

and

(iv) oxidizing the sulphonamide of formula (V) with an oxidation agent to yield 5-(2-chloro-4-trifluoromethylphenoxy)-2-nitro-N-alkanesulphonyl benzamide of formula (I).



**4,314,079**

## NOVEL METHOXYETHYLAMINE

**Sivaraman Raghu, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.**

**Division of Ser. No. 63,289, Aug. 2, 1979, Pat. No. 4,245,103, which is a continuation of Ser. No. 958,222, Nov. 6, 1978, abandoned. This application May 21, 1980, Ser. No. 152,268**

**Int. Cl.³ C07C *103/44***

**U.S. Cl. 564—220** **1 Claim**

1. The compound N-(2-phenyl-2-acetylamino)ethyl-2-methoxyethylamine.

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**4,314,080**

## N-FORMYLATION OF 2-AMINO-2-METHYL-1-PROPANOL WITH CHLORAL HYDRATE

**Mohammed T. Shipchandler, Libertyville, Ill., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.**

**Filed Nov. 10, 1980, Ser. No. 205,113**

**Int. Cl.³ C07C *102/00***

**U.S. Cl. 564—224** **3 Claims**

1. A method for preparing 2-methyl-2-N-formylamino-1-propanol by the step of reacting 2-amino-2-methyl-1-propanol with chloral in about an equimolar ratio.

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**4,314,081**

## ARLOXYPHENYLPROPYLAMINES

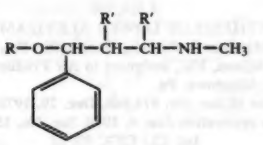
**Bryan B. Molloy, and Klaus K. Schmiegel, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Filed Jan. 10, 1974, Ser. No. 432,379**

**Int. Cl.³ C07C *93/06***

**U.S. Cl. 564—347** **9 Claims**

1. A compound of the formula



wherein each R′ is independently H or $CH_3$ and R is m- or p-chlorophenyl, o-, m-, or p-methoxyphenyl, phenyl, o- or m-fluorophenyl, o- or p-tolyl, 2,4-difluorophenyl or p-trifluoromethylphenyl and acid addition salts formed with pharmaceutically-acceptable acids.

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**4,314,082**

## DERIVATIVES OF 2-AMINO-6,7-DIHYDROXYTETRAHYDRO NAPHTHALENE (ADTN)

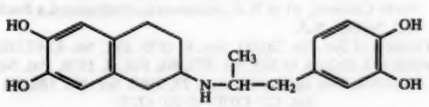
**David M. Stout, Vernon Hills, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.**

**Continuation of Ser. No. 924,763, Jul. 14, 1978, abandoned. This application Jan. 23, 1980, Ser. No. 114,531**

**Int. Cl.³ C07C *87/28***

**U.S. Cl. 564—381** **1 Claim**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof.

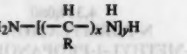
**4,314,083**

## PREPARATION OF LINEAR POLYALKYLENE POLYAMINES

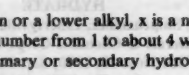
**Michael E. Ford, Trexlertown, and Thomas A. Johnson, Orefield, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**

**Filed Oct. 3, 1980, Ser. No. 193,762**
**Int. Cl.³ C07C 85/06**
**U.S. Cl. 564—479** **16 Claims**

1. A process for preparing a noncyclic polyalkylene polyamine comprising the steps of: contacting an alkyleneamine compound having two primary amino groups of the formula:



wherein R is hydrogen or a lower alkyl, x is a number from 2 to about 6, and y is a number from 1 to about 4 with a hydroxy compound having primary or secondary hydroxyl groups of the general formula:



wherein R is hydrogen or a lower alkyl, x is a number from 2 to about 6; and y is a number from 0 to about 3;

said contacting being performed in the presence of a catalytically effective amount of a salt of a substance of nitrogen or sulfur or their corresponding acids at temperatures sufficient to effect reaction between said alkyleneamine and said hydroxy compound under a pressure sufficient to maintain the reaction mixture essentially in liquid phase.

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**4,314,084**

## SYNTHESIS OF LOWER ALKYL AMINES

**Joaquin V. Martinez de Pinillos, Wescosville, Pa., and Robert L. Fowlkes, Milton, Fla., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**

**Continuation of Ser. No. 974,644, Dec. 29, 1978, abandoned. This application Jun. 4, 1980, Ser. No. 156,228**
**Int. Cl.³ C07C 85/02**
**U.S. Cl. 564—480** **6 Claims**

1. A gas phase process for producing lower alkylamines by the ammonolysis of lower alkanols which comprises contacting a lower alkanol having 2 to 6 carbon atoms with 2 to 20 mols of ammonia per mol of alkanol in the presence of 0.25 to 4 mols of hydrogen per mol of alkanol and a Group 8 hydrogenation catalyst carried on a support at a temperature of from 350° to about 500° F.,

said hydrogenation catalyst being a finely divided hydrogenation catalyst comprising a Group 8 metal supported on a substantially neutral alumina support, said neutrality being incorporated into said support by the addition of an alkaline earth metal.

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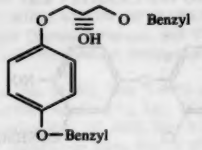
**4,314,085**

## INTERMEDIATES FOR PREPARING ADRENERGIC BLOCKING AGENTS

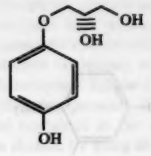
**Kenneth E. Fahrenholtz, Bloomfield; Robert W. Guthrie, Saddle Brook; Richard W. Kierstead, and Jefferson W. Tilley, both of North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

**Division of Ser. No. 73,051, Sep. 6, 1979, Pat. No. 4,247,710, which is a division of Ser. No. 875,966, Feb. 8, 1978, Pat. No. 4,202,978. This application Aug. 22, 1980, Ser. No. 180,271**
**Int. Cl.³ C07C 43/20, 43/23**
**U.S. Cl. 568—644** **2 Claims**

1. The compound of the formula




2. The compound of the formula

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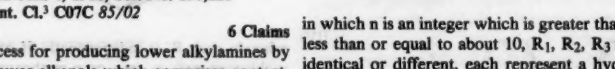
**4,314,086**

## PREPARATION OF ALIPHATIC/AROMATIC ETHERS

**Gerard Soula, Meyzieu, and Daniel Michelet, Tassin-la-Demi-Lune, both of France, assignors to Rhone-Poulenc Industries, Paris, France**

**Filed Jun. 20, 1980, Ser. No. 161,516**
**Claims priority, application France, Jun. 20, 1979, 79 15782**
**Int. Cl.³ C07C 41/00, 41/16**
**U.S. Cl. 568—652** **26 Claims**

1. A process for the preparation of an aliphatic/aromatic ether, comprising reacting an aliphatic halide with an alkali or alkaline earth metal, or ammonium phenolate or naphtholate, in the presence of a catalytic amount of at least one tertiary amine sequestering agent having the formula:



(I)

in which n is an integer which is greater than or equal to 0 and less than or equal to about 10, $R_1$, $R_2$, $R_3$ and $R_4$, which are identical or different, each represent a hydrogen atom or an alkyl radical having from 1 to 4 carbon atoms and $R_5$ represents an alkyl or cycloalkyl radical having from 1 to 12 carbon atoms, a phenyl radical or a radical $—C_mH_{2m}—\phi$ or $C_mH_{2m+1}—\phi—$, wherein $\phi$ is phenyl and in which m ranges from 1 to 12.

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**4,314,087**

## METHODS OF SYNTHESIZING HEXAFLUOROISOPROPANOL FROM IMPURE MIXTURES AND SYNTHESIS OF A FLUOROMETHYL ETHER THEREFROM

**Phillip C. Radlick, Irvine, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Dec. 26, 1979, Ser. No. 107,116**
**Int. Cl.³ C07C 31/34, 31/38**
**U.S. Cl. 568—842** **12 Claims**

1. The method of oxidizing hexafluoropropylene to form an impure mixture comprising hexafluoroacetone and hexafluoropropylene and thereafter subjecting said impure mixture to reducing conditions to hydrogenate said hexafluoroacetone to 1,1,1-3,3,3-hexafluoroisopropanol product, whereby the product is easily separable from the hexafluoropropylene impurity.

4,314,088

## HYDROXYLATION OF OLEFINS

**Richard G. Austin, Ridgewood, and Robert C. Michaelson, Waldwick, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Nov. 24, 1980, Ser. No. 209,789**
**Int. Cl.³ C07C *29/03***
**U.S. Cl. 568—860** **11 Claims**

1. A method for preparing polyols by the homogeneous catalytic hydroxylation of an olefinic compound having 2 to 20 carbons by contacting said olefinic compound with a catalytic amount of an osmium compound and a "co-catalyst selected from the group consisting of an alkali metal halide, an alkaline earth metal halide, a halogen, a hydrogen halide, and a tetraalkyl or aryl phosphonium halide" in an inert polar solvent and an organic hydroperoxide and at least a stoichiometric amount of water based on said amount of said olefin.

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4,314,089

## PROCESS FOR THE PREPARATION OF NITROSOBENZENE

**Hans Zengel, Kleinwallstadt; Manfred Bergfeld, Erlenbach, and Werner Klostermeier, Klingenbeg, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.**

**Filed Mar. 13, 1980, Ser. No. 129,959**
**Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933314**
**Int. Cl.³ C07C *76/00, 81/02***
**U.S. Cl. 568—949** **7 Claims**

1. An improved process selectively preparing nitrosobenzene by catalytically reducing nitrobenzene with a reducing agent selected from the group consisting of saturated aliphatic hydrocarbons containing from about 1 to about 20 carbon atoms, cycloaliphatic compounds containing from about 4 to about 12 carbon atoms, benzene, naphthalene, and ethylenically unsaturated compounds containing from about 2 to about 10 carbon atoms, wherein the improvement comprises adding to the reaction mixture from about 0.05 to about 4.0 moles of water per mole of nitrobenzene preliminary to the selective catalytic reduction.

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4,314,090

## LINEAR ALPHA OLEFIN PRODUCTION

**William E. Shewbart, Lake Jackson; Steve A. Sims; Billy D. Head, both of Angleton, and G. Eldon White, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Aug. 18, 1980, Ser. No. 179,348**
**Int. Cl.³ C07C *2/88***
**U.S. Cl. 585—328** **2 Claims**

1. A process for producing alpha olefins in the range of about 4 to about 10 carbon atoms per molecule which comprises:

(a) feeding ethylene which may be in part in a recycle system derived from a purification of the product of the process, and triethyl or tributyl or mixed tri(ethylbutyl) aluminum compound in the absence of any significant amount of product olefin in the range of 4 to 10 carbon atoms into a growth reaction system maintained at a temperature between about 100 and 140° C. and a pressure of between about 400 to 800 psig for from about 5 to 90 minutes residence time wherein the ratio of $C_2H_4$ to trialkylaluminum compound is at least 5 to 1, respectively,

(b) separating the unreacted olefins from the trialkyl aluminum growth product,

(c) displacing the alkyl moieties from the trialkyl aluminum growth product by contacting the growth product with $C_2H_4$, $C_4H_8$, or a mixture of $C_2H_4$ and $C_4H_8$ at a temperature of between about 200° C. and 300° C. for between about 0.1 to about 2.5 seconds residence time under elevated pressure 100 to 500 psig, thereby to displace the higher alkyl moieties of the trialkyl aluminum growth product and replace the displaced alkyl growth moieties with $C_2H_4$ and $C_4H_8$,

(d) separating the α-olefin products obtained in the displacement step from the tri lower alkyl aluminum products produced on said displacement step,

(e) returning the tri lower alkyl aluminum products to step (a),

(f) separating the olefins in the gaseous effluent from said displacement products separation step (d),

(g) separating the gaseous effluent into its component parts, including $C_2H_4$ and $C_4H_8$,

(h) recycling the $C_2H_4$ component to step (a) and/or step (c) and the $C_4H_8$ to step (c), and

(i) recovering the $C_4$, $C_6$, $C_8$, and $C_{10}$ α-olefins as product components.

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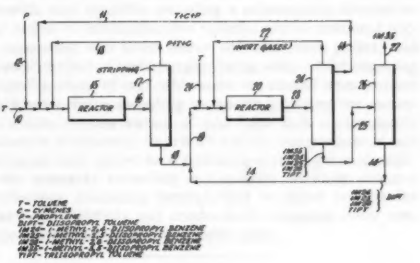
4,314,091

## PREPARATION OF 1-METHYL-3,5-DIISOPROPYL BENZENE FROM CHARGE STREAMS CONTAINING DIISOPROPYL TOLUENE

**John M. Crone, Jr., Fishkill, and Robert M. Suggitt, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.**

**Filed Mar. 31, 1980, Ser. No. 135,609**
**Int. Cl.³ C07C *4/12***
**U.S. Cl. 585—486** **5 Claims**




1. The method which comprises

dealkylating in a dealkylation operation a charge stream containing desired 1-methyl-3,5-diisopropyl benzene and at least one other undesired diisopropyl toluene in the presence of dealkylating catalyst at dealkylating conditions including temperature of 200° F.–800° F. thereby forming dealkylated product stream containing 1-methyl-3,5-diisopropyl benzene and decreased proportions of said other undesired diisopropyl toluene in the diisopropyl toluene fraction;

recovering from said dealkylation operation said dealkylated product stream containing said 1-methyl-3,5-diisopropyl benzene and decreased proportions of other undesired diisopropyl toluenes in the diisopropyl toluene fraction; and

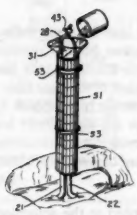
separating 1-methyl-3,5-diisopropyl benzene from said dealkylated product stream.

4,314,092

## METHODS OF AND APPARATUS FOR REHABILITATING OUTSIDE TELEPHONE PLANT

Mills L. Fleming, Lawrenceville, and Francis J. Mullin, Chamblee, both of Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J. and Western Electric Company, Inc., New York, N.Y.

Filed Apr. 29, 1980, Ser. No. 144,818
Int. Cl.[3] H02G *15/196, 1/14*
U.S. Cl. 174—38 24 Claims



1. An enclosed cable splice comprising:

a liner which is made of a plastic material and which is wrapped about adjacent end portions of a plurality of cables, said cables each comprising a plurality of insulated conductors and a jacket that encloses the conductors, said conductors of one of said cables being spliced to conductors of another cable;

a length of tubing which is made of a relatively supple plastic material and which encloses said liner and the end portions of the cables, said tubing having at least one end wrapped into secured engagement with at least one of the jackets of the cables;

a waterproofing material disposed within said tubing between said tubing and said liner and between said liner and the cables to encapsulate the adjacent end portions of the cables; and

a cover which is made of a plastic material and which surrounds said tubing to form an open ended cylindrical closure, said cover being capable of maintaining the integrity of the tubing and of providing a mold for said tubing and said waterproofing material which is disposed within said tubing.

15. A method of rehabilitating a cable splice, said method including the steps of:

moving a length of plastic tubing over an end portion of at least one cable with the tubing being collapsed over a jacketed portion of the cable;

wrapping a length of a perforated liner about the at least one cable and at least another cable to which said at least one cable is spliced, the width of said liner being sufficient to cover said portions of said cables having insulated conductors thereof exposed;

extending said tubing about said length of liner to enclose the liner with an open end of said tubing being positioned beyond the spliced conductors;

wrapping a length of a cover about the tubing, said cover having a width which is sufficient to enclose said tubing;

flowing a waterproofing material into said tubing and through the perforations of said liner to mechanically bond said waterproofing material to said liner; and

closing the open end of said tubing.

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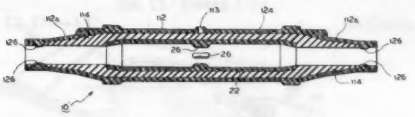
4,314,093

## CABLE CONNECTOR

Raymond W. Eldridge, and David F. Winter, both of St. Louis, Mo., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 29, 1979, Ser. No. 25,262
Int. Cl.[3] H02G *15/184*
U.S. Cl. 174—73 R 3 Claims



2. A splice connector for splicing adjacent ends of insulated and shielded primary distribution system cables comprising: a unitary splice body assembly of molded elastomeric material including a generally tubular longitudinal portion for receiving the cable ends from opposite sides thereof, said assembly including a semiconductive inner sleeve for surrounding the connection between said cable ends in conductive relationship therewith, said assembly including a substantially continuous outer jacket of semiconductive material and an insulated portion separating said inner sleeve and said outer jacket, said insulated portion of said assembly being adapted for engaging insulated portions of said cable ends, the central inner portion of said inner sleeve including means for engaging the electrically conductive connection of said cable ends in electrically conductive relationship therewith, and the end portions of said continuous outer jacket each including at least one circumferentially arcuately extending and radially inwardly directed protuberance extending through said insulated portion for respectively yieldably and conductively engaging outer conductive jacket portions of said cable ends.

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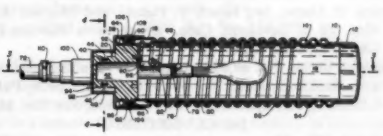
4,314,094

## CABLE SEAL SPLICE ENCLOSURE

Bert A. Smith, Northridge, Calif., assignor to Preformed Line Products Co., Cleveland, Ohio

Filed Dec. 26, 1979, Ser. No. 106,455
Int. Cl.[3] H02G *15/08*
U.S. Cl. 174—78 6 Claims



1. A cable splice enclosure for cable splices, comprising

a vial having a first, open end and internal threads;

a body of sealant contained within said vial;

a sleeve having external threads substantially along its length and two open ends, said external threads on said sleeve being corrugations in the wall of said sleeve and being

sized and adapted to mate with said internal threads on said vial, said sleeve being adapted to be positioned in said vial with a first said open end of said sleeve deep in said vial;

a plug sized and adapted to substantially close a second said open end of said sleeve, said plug having passageways therethrough for receipt of cables; and

a locking means associated with the second said open end of said sleeve and said plug for fixing said plug in said sleeve.

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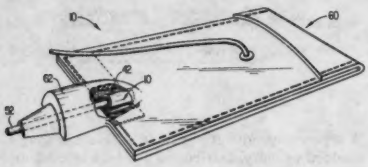
## 4,314,095
## DEVICE AND METHOD FOR MAKING ELECTRICAL CONTACT

**Eric R. Moore, Pittsburgh; Marlin S. Heilman, Gibsonia, and Philip C. Kinney, Pittsburgh, all of Pa., assignors to Mieczyslaw Mirowski, Owings Mills, Md.**

**Filed Apr. 30, 1979, Ser. No. 34,731**
**Int. Cl.³ H01R *4/18*; A61N *1/36***
**U.S. Cl. 174—84 C** **18 Claims**



1. Apparatus for use in a discharge electrode adapted for implantation in a patient to effect an electrical discharge into the heart, the combination of:

silver tinsel wire for electrically connecting said electrode to a power source;

a deformable electrically-conductive metallic tubular sleeve having inner and outer surfaces and a flared end for receiving said silver tinsel wire, said sleeve for surrounding a portion of said silver tinsel wire, said flared end defining a corrosion zone spaced from said silver tinsel wire; and

a metallic U-shaped clip, the arms of said clip being arranged in spaced-apart relationship with an end portion of each arm turned arcuately outward, thereby forming a central elongated channel for receiving a portion of the electrode and said sleeve with said portion of said silver tinsel wire therein,

whereby upon deforming said clip by moving said arms closer together than in said spaced-apart relationship after said electrode and said sleeve are placed in said channel, a first electrical connection between said silver tinsel wire and said inner surface of said sleeve and a second electrical connection between the electrode and said outer surface of said sleeve are created with said sleeve protecting the silver tinsel wire during deformation of said clip.

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## 4,314,096
## PRE-LOAD APPARATUS AND METHOD FOR TRAVELLING WAVE DIGITIZER

**Frank P. Carau, Sr.; Henry T. Hetzel, and Michael A. Tremblay, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Division of Ser. No. 69,956, Aug. 27, 1979, abandoned, which is a continuation of Ser. No. 944,931, Sep. 22, 1978, Pat. No. 4,255,617. This application Aug. 25, 1980, Ser. No. 181,294**
**Int. Cl.³ G08C *21/00***
**U.S. Cl. 178—19** **4 Claims**

1. A digitizer comprising:

first reference signal means for producing a first reference signal at a first reference frequency;

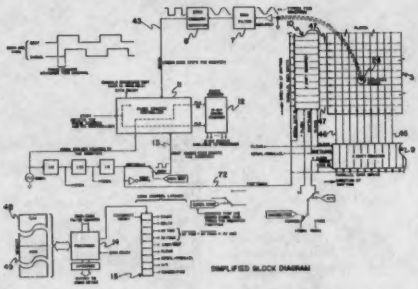
fine clock signal means for generating a fine clock signal having a fine clock frequency that is a multiple of the first reference frequency;

coarse clock signal means for generating a coarse clock signal having a coarse clock frequency that is both a multiple of the first reference frequency and higher than the fine clock frequency;

pre-load reference signal means for producing a pre-load reference signal at a pre-load reference frequency that is higher than the first reference frequency;

pre-load clock signal generation means for generating a pre-load clock signal at pre-load clock frequency that is to the pre-load reference frequency as the fine clock frequency is to the first reference frequency;

selection means receiving the first and pre-load reference signals and also receiving the coarse, fine and pre-load clock signals, for respectively producing at a reference output and at a clock output the first reference signal and the coarse clock signal during a first interval, the pre-load reference signal and the pre-load clock signal during a second interval, and the first reference signal and the fine clock signal during a third interval;



control means coupled to the selection means, for preceding each third interval by a second interval, for terminating the second interval in synchronism with a selected transition in the pre-load reference signal, and for commencing the third interval in synchronism with a transition in the first reference signal corresponding to the selected transition in the pre-load reference signal;

a platen including a grid of uniformly spaced parallel conductors; and

propagation circuit means coupled to the reference output and to the clock output and also coupled to the uniformly spaced parallel conductors of the platen, for propagating across the platen at a rate of one conductor per cycle of the signal present at the clock output a field having transitions in intensity corresponding to transitions in the amplitude of the signal present at the reference output.

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## 4,314,097
## AUTHENTICATOR DEVICE FOR PRECLUDING COMPENSATING TEXT MODIFICATIONS IN TRANSMITTED MESSAGES

**Carl M. Campbell, Jr., Newtown Square, Pa., assignor to Burroughs Corporation, Detroit, Mich.**

**Filed Mar. 10, 1980, Ser. No. 128,667**
**Int. Cl.³ H04L *9/00***
**U.S. Cl. 178—22.08** **11 Claims**

1. A cryptographic system for enciphering a message comprised of n plain text characters under control of an authenticator key comprised of k digits and producing an authenticator code, said authenticator code for insertion at a predetermined point within said message as a means of preventing undetected compensating changes to the message text, said system comprising:

transform means, responsive to each character of said n character message, said transform means for transforming each of said n characters as a function of said authenticator key, whereby a transformed character Zn is generated

for each of said n characters of said message, said transform means including

first combining means for combining each of said n characters with the contents of a writable storage unit,

addressable storage means (T3) connected to said first combining means, said addressable storage means (T3) for storing said transformed characters Zn, and

feedback means, connected to said first combining means, said feedback means for storing a new value in said writable storage unit after each of said n characters is combined with the contents of said writable storage unit;

means for storing said authenticator code; and

means connected to said transform means and said authenticator code storage means, said means for combining each of said transformed characters Zn with information contained in said authenticator code storage means and substituting the combined result back into said authenticator code storage means.

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**4,314,098**

## REVERSIBLE ELECTROACOUSTIC TRANSDUCER DEVICE HAVING A CONSTANT DIRECTIVITY CHARACTERISTIC OVER A WIDE FREQUENCY BAND

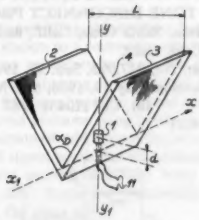
**Charles Maerfeld, Paris, France, assignor to Thomson-CSF, Paris, France**

**Continuation of Ser. No. 913,347, Jun. 7, 1978, abandoned. This application Nov. 2, 1979, Ser. No. 90,671**

**Claims priority, application France, Jun. 10, 1977, 77 17861**

**Int. Cl.³ H04R *1/20***

**U.S. Cl. 179—1 MF** **12 Claims**



1. A reversible electroacoustic transducer device having a constant directivity characteristic over a wide frequency band capable of exceeding an octave and forming a directional acoustic antenna in a propagation medium, comprising:

at least one omnidirectional electroacoustic transducer having dimensions less than one-half the wave length of the highest frequency of said wide frequency band in the propagation medium;

linear geometric surface means for reflecting acoustical signals to and from said at least one transducer, comprising plural linear geometric surfaces each having zero acoustic impedance, said surfaces delimiting a geometrically shaped space and including at least two lateral walls defining respective planes which form an apex at the intersection of said planes and an aperture opposite said apex;

said aperture dimensioned at least twice the wavelength of the lowest frequency of said wide frequency band; and

said at least one electroacoustic transducer having a center placed in the space delimited by said reflecting surfaces at a distance from said apex less than 0.4 times the wavelength of the highest frequency of said wide frequency band.

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**4,314,099**

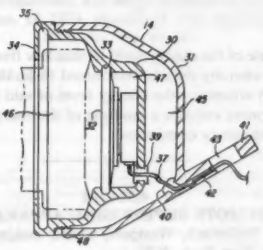
## FLUID-INSULATED UNIVERSAL FLEXIBLE ACOUSTIC COUPLER MUFF SYSTEM

**John A. Jeffries, and Mark H. Ruch, both of Austin, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Nov. 2, 1979, Ser. No. 90,726**

**Int. Cl.³ H04M *1/14***

**U.S. Cl. 179—1 C** **10 Claims**



1. A universal acoustic muff adapted to enclose a speaker or a microphone, for receiving an earpiece or mouthpiece of a telephone handset, comprising:

(a) an external housing having an aperture;

(b) an internal housing having a speaker/microphone cavity for receiving the speaker or microphone, opening into an earpiece/mouthpiece cavity, positioned within the external housing so that the earpiece/mouthpiece cavity opens into the external housing aperture, and further comprising a flexible, peripheral flange surrounding the earpiece/mouthpiece cavity, the flange being sufficiently large to enclose the earpiece or mouthpiece of any available telephone handset; and

(c) a fluid insulator formed between the inner surface of the external housing and the outer surface of the internal housing for attenuating outside mechanical noise.

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**4,314,100**

## DATA DETECTION CIRCUIT FOR A TASI SYSTEM

**Peter G. Ruether, Boulder; Patrick A. Vachon, Arvada, and John F. O'Neill, Boulder, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.**

**Filed Jan. 24, 1980, Ser. No. 115,107**

**Int. Cl.³ G10L *1/00***

**U.S. Cl. 179—1 SC** **10 Claims**

1. In a time assigned speech interpolation system in which incoming speech signals from a plurality of input lines are directed to a remote location via a lesser plurality of transmission facilities, said system including:

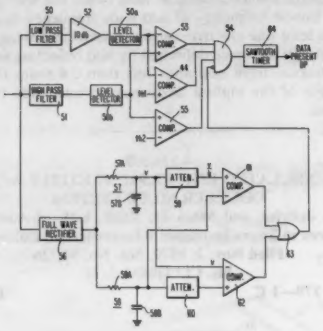
switching means for connecting said input lines to said transmission facilities;

control means, said switching means being responsive thereto, for controlling said switching means, the improvement comprising:

a circuit for determining whether an incoming signal represents speech or data, said circuit having;

a means for separating low frequency components of said signal from high frequency components of said signal; and

a means responsive to said separating means for comparing the energy level of said high frequency component with a




multiple of the energy level of said low frequency component, whereby data is determined to be more likely than speech whenever the energy level of said high frequency component exceeds a multiple of the energy level of said low frequency component.

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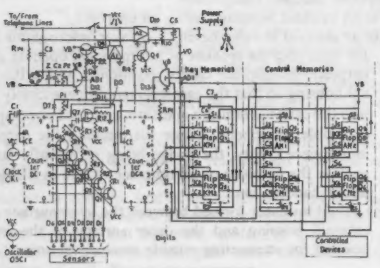
**4,314,101**

## REMOTE SUPERVISING APPARATUS

**Ragnar F. Stalemark, Westport, Conn., assignor to Camil P. Spiecens, New York, N.Y.**

**Filed Dec. 10, 1979, Ser. No. 102,031**
**Int. Cl.³ H04M *11/06***
**U.S. Cl. 179—2 A** **10 Claims**



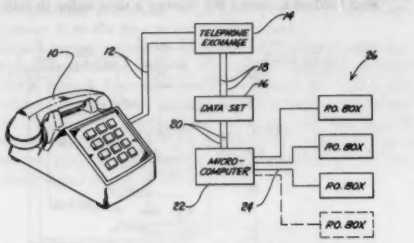

1. Apparatus for remotely supervising, via a telephone line, a device comprising: sensing means for sensing for a telephone ring signal from the telephone line; means operative when said sensing means senses a telephone ring signal for simulating an off-hook condition in order to terminate the telephone ring signal; indicating means operative when said sensing means senses a telephone ring signal and after said off-hook condition is simulated for repeatedly producing a melody to form a series of melodies; said melody being at least one tone signal; means for transmitting said series of melodies to the telephone line; counting means for counting the melodies in the series as they are produced; key memory means connected to said telephone line and to said counting means for recording the presence or absence of a voice signal on the telephone line when a predetermined count has been counted by said counting means; and control means responsive to said key memory means for emitting a signal which changes the condition of the device if said key memory means recorded the presence of a voice signal on the telephone line when said predetermined count occurred.

**4,314,102**

## POST OFFICE BOX MONITORING SYSTEM

**Lynnwood Lowe, Darien, and Robert B. McFiggans, Stamford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.**

**Filed Feb. 13, 1980, Ser. No. 121,206**
**Int. Cl.³ H04M *11/10*; G08B *21/00***
**U.S. Cl. 179—2 A** **7 Claims**




1. Apparatus for remotely detecting the presence of articles in a container comprising:

(a) container means;

(b) computing means connected to said container means having a microswitch, said microswitch being actuatable by articles placed in said container means, and said computing means having a pressure plate adjacent said microswitch adapted to support said article in said container means for detecting the presence of an article and for generating data responsive to the presence of said article;

(c) said container means being dimensioned so that said articles may be positioned within said container means in a first position which causes said microswitch to be actuated and a second position which causes said microswitch not to be actuated;

(d) remote interrogating means connectable to said computing means for accessing said data therefrom; and

(e) answer-back means operatively coupled to said remote interrogating means for providing audible signal information in response to actuation by said remote interrogating means.

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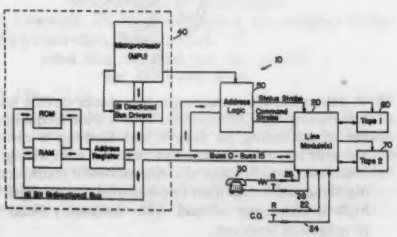
**4,314,103**

## TELEPHONE ANSWERING SYSTEM WITH SIMULATED DIAL TONE DISCONNECT PROTECTION

**Donald R. Wilson, Santa Cruz, Calif., assignor to Plantronics, Inc., Santa Cruz, Calif.**

**Division of Ser. No. 947,095, Sep. 29, 1978, abandoned. This application May 19, 1980, Ser. No. 151,295**
**Int. Cl.³ H04M *1/65***
**U.S. Cl. 179—6.11** **1 Claim**




1. In an automatic telephone answering and message recording system having remote access message playback capability

and including a message record tape, the improvement comprising:

a signal detector for monitoring the telephone line to detect incoming line signals, said signal detector producing a binary data signal indicative of the status of a detected incoming line signal to be recorded on the message tape as being a steady tone of any frequency in the audio spectrum;

a data processor coupled to the signal detector and receiving the binary data signal as a data input for evaluating the signal in accordance with prescribed criteria through a sequence of operations to determine: (a) the existence, over a first prescribed time interval, of a steady tone signal status indication from the signal detector and (b) whether the signal on the telephone line is dial tone;

the processor evaluating the signal for an uninterrupted existence of a steady tone signal status indication from the signal detector over a second prescribed time interval to determine that dial tone is on the telephone line;

processor actuated means for disconnecting from the telephone line in response to a determination that the telephone line signal is dial tone; and

processor actuated means for inserting a blank interval of prescribed duration in an incoming line signal prior to recording on the message record tape upon a determination by the processor that a steady tone signal status indication has been in existence over the first prescribed time interval, thereby producing an interruption of the incoming line signal within a time period equal to the second prescribed time interval of the processor evaluations, so as to prevent a simulation of dial tone by the recorded signal and actuation of the disconnecting means.

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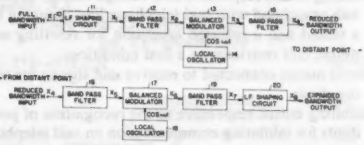
## 4,314,104
## NARROW BAND VOICE MODULATOR SYSTEM

**Richard W. Harris, Stockton, and John F. Cleveland, Folsom, both of Calif., assignors to VBC, Inc., Lodi, Calif.**

**Filed Dec. 13, 1976, Ser. No. 749,857**
**Int. Cl.[3] G10L *1/00***
**U.S. Cl. 179—15.55 R** **47 Claims**




1. A method of transmitting information bearing input signals from a sending station to a receiving station via a communication link having a predetermined system frequency band width, said input signals having first portions lying predominantly within a first fractional portion of said system frequency band width and second portions lying predominantly within a second fractional portion of said system frequency band width, said first and second signal portions being substantially temporally spaced and said second fractional band width portion lying outside said first fractional bandwidth portion, said method comprising the steps of:

(a) passing said input signals through a first filtering means to selectively attenuate said first portions;

(b) processing the signals resulting from step (a) to produce first equivalent signals having first frequency spectrum components lying predominantly within said second fractional bandwidth portion, said first frequency spectrum components corresponding to said first and second portions of said input signals;

(c) continuously coupling the signals resulting from step (b) to a transmitting device;

(d) transmitting the signals coupled to said transmitting device to said receiving station;

(e) processing the received signals from step (d) to produce second equivalent signals having second frequency spectrum components lying within said second fractional bandwidth portion and corresponding to said second portions of said input signals, third frequency spectrum components lying within said first and second fractional bandwidth portions and corresponding to said first portions of said input signals, and fourth frequency spectrum components lying within said first fractional bandwidth portion and representing redundant signal information; and

(f) continuously coupling the signals resulting from step (e) to a receiver device.

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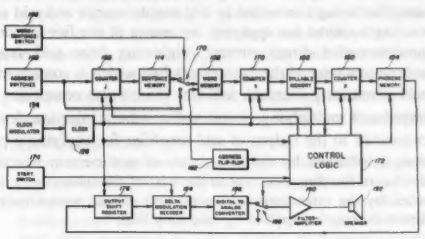
## 4,314,105
## DELTA MODULATION METHOD AND SYSTEM FOR SIGNAL COMPRESSION

**Forrest S. Mozer, 38 Somerset Pl., Berkeley, Calif. 94707**

**Division of Ser. No. 761,210, Jan. 21, 1977, Pat. No. 4,214,125, which is a continuation of Ser. No. 632,140, Nov. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 525,388, Nov. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 432,859, Jan. 14, 1974, abandoned. This application Oct. 2, 1979, Ser. No. 81,281**
**Int. Cl.[3] H04B *1/00***
**U.S. Cl. 179—15.55 R** **8 Claims**




1. A system for expanding floating zero delta modulated compressed information signals corresponding to original information time domain signals, said system comprising:

memory means for storing said compressed information signals;

storage means for temporarily storing a signal representative of the amplitude of a sample point on a synthesized waveform corresponding to one of said original information time domain signals, said storage means having an output terminal for manifesting the signals stored therein;

means for contemporaneously accessing successive compressed information signals corresponding to three adjacent sample points of said original information signals;

means coupled to said accessing means for comparing said successive compressed information signals accessed from said memory means and for generating an incremental signal value restricted to one of a predetermined confined number of values when the difference between said successive compressed information signals is within the most positive one half of said confined number of values and restricted to the negative of said one of a predetermined confined number of values when said difference is within the most negative one half of said confined number of values;

adder means coupled to said generating means and said storage means for algebraically combining said incremental signal value with said synthetic waveform sample point signal to produce a successive synthesized waveform sample point signal; and

timing and control means for replacing the contents of said storage means with said successive synthesized waveform sample point signal and for enabling said accessing means to contemporaneously access the next successive com-

pressed information signals corresponding to the next adjacent sample points.

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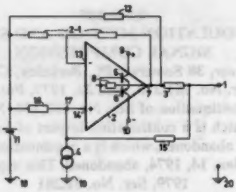
4,314,106

## LINE CIRCUIT

Pieter Bakker, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,275
Claims priority, application Netherlands, May 10, 1979, 7903664
Int. Cl.³ H04B 1/58; H04Q 1/28
U.S. Cl. 179—16 F 7 Claims



1. A line circuit comprising: a connecting terminal, a supply source, an amplifier having a low output impedance, said amplifier being connected to said supply source and said connecting terminal for applying, by means of the line circuit, a predetermined direct current originating from said supply source to a wire of the subscriber's line which is connected to said connecting terminal, said line circuit also comprising an impedance multiplying circuit and a current injection device connected to the output of said amplifier for applying a portion, determined by the impedance of said current injection device, of the direct current to the wire of the subscriber's line, whereby the remaining smaller portion of said predetermined direct current is supplied by said amplifier.

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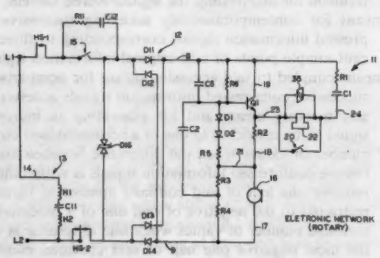
4,314,107

## SUBSCRIBER STATION NETWORKS

Alfred M. Hestad, Chicago, Ill.; Michael Tentler, Kenosha, Wis., and Levi L. Rose, Chicago, Ill., assignors to United Networks, Inc., Chicago, Ill. and Manu-Tronics, Inc., Kenosha, Wis.

Filed Dec. 26, 1979, Ser. No. 107,143
Int. Cl.³ H04M 1/58
U.S. Cl. 179—81 R 11 Claims




1. A subscriber station network for controlling signals transmitted and/or received over telephone lines,

said network comprising a pair of line terminals connecting said network to said telephone lines,

transmitter means for transmitting signals through said pair of line terminals,

receiver means for receiving signals through said pair of line terminals,

amplifying means for use in controlling the amplitude of said signals,

means for coupling said amplifying means in series with said transmitter means across said pair of line terminals, and

receiver coupling means for coupling said receiver means across said amplifying means, whereby cancellation of transmitted signals received by the receiver means occurs and side tone at said receiver means is controlled.

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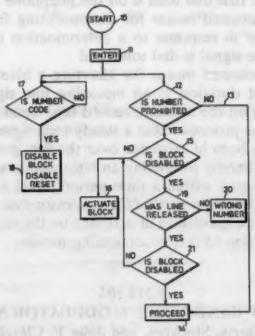
4,314,108

## KEY SET TOLL RESTRICTOR

Martin M. Sharvit, Thornhill, Canada, assignor to Cindon Research Inc., Rexdale, Canada

Filed Apr. 2, 1980, Ser. No. 136,735
Int. Cl.³ H04M 1/66
U.S. Cl. 179—90 D 12 Claims




1. A telephone call restrictor comprising:

input means including terminals for connecting said telephone call restrictor to a telephone line for receiving dial signals;

resetting means responsive to a voltage change to said terminals associated with said telephone line changing between a seized and a released condition for resetting said telephone call restrictor to a first condition;

circuit means connected to receive said signals for recognizing digits;

inhibiting means responsive to the recognition of prohibited digits for inhibiting communication on said telephone line; and

means responsive to the recognition of an access code for disabling said inhibiting means and said resetting means for a predetermined time period,

whereby said telephone line may be released and reseized without said telephone call restrictor reverting to said first condition.

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4,314,109

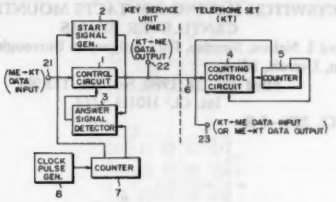
## SYNCHRONIZATION SYSTEM FOR KEY TELEPHONE SYSTEM

Koichi Sekiguchi, Asaka, and Kazuyuki Yamamoto, Yokohama, both of Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha and Nippon Telegraph & Telephone Public Corporation, both of, Japan

Filed May 20, 1980, Ser. No. 151,733
Claims priority, application Japan, Jun. 5, 1979, 54-70375
Int. Cl.³ H04J 3/06, 3/12; H04M 1/72
U.S. Cl. 179—99 M 1 Claim

1. A synchronization system for a key telephone system, in which key information or the like information signal between a key service unit and each key telephone set is transmitted in the form of a time-division pulse signal under the control of a first counter provided in the key service unit, characterized in

that the information signal has a format which is divided into a first signal from the key service unit to each key telephone set and a second signal from each key telephone set to the key service unit so as to make distinction between the first signal and the second signal in terms of time, the first signal being disposed in a time slot preceding the second signal to provide a pair of signal groups, a one-pulse start signal being disposed in the foremost time slot of the signal groups and a one-pulse answer signal is disposed in a time slot between the first and second signals; said each key telephone set comprising a second counter for producing a reference signal for controlling




the transmission of the information signal in the key telephone set and a counting control circuit for detecting the start signal to start the second counter; said key service unit comprising an answer detector for detecting, as the answer signal, a pulse present in the information signal when a certain period of time has passed after occurrence of the start signal and a control circuit for stopping the first signal for a certain period of time when the answer signal is not detected by the answer signal detector after the certain period of time has passed after occurrence of the answer signal, whereby the first counter and the second counter are synchronized with each other.

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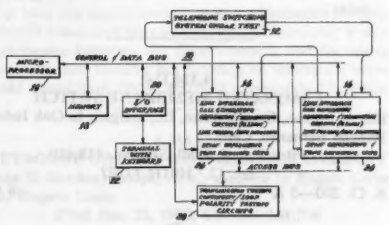
**4,314,110**

## SYSTEM FOR THE TESTING OF TELEPHONE SWITCHING SYSTEMS

**Charles J. Breidenstein, and Charles A. Barbe, III, both of Rochester, N.Y., assignors to Redcom Laboratories, Inc., Rochester, N.Y.**

**Filed Aug. 13, 1980, Ser. No. 177,659**
**Int. Cl.[3] H04M 3/24**
**U.S. Cl. 179—175.2 R** **16 Claims**




1. A system for generating calls in order to test telephone switching systems by simulating traffic loads thereon which comprises from one to a given plurality of independent and identical means for originating a plurality of calls each independently and in selected sequence and number on command and applying said calls each to a different calling line of a group of lines of a telephone switching system which is under test, separate first register means for each of said originating means each having an array of memory groups which groups each have a plurality of locations in excess of the number necessary for said commands to enable access for said commands and for different input/output data associated with the testing of the lines of said telephone switching system under test, and microprocessor control means for generating said commands connected to said originating means and said register means thereof.

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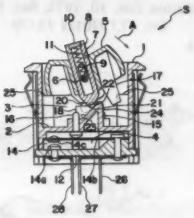
**4,314,111**

## COMBINED DOUBLE SWITCH UNIT

**Mitsuo Kobayashi, Gifu, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan**

**Filed May 30, 1980, Ser. No. 155,111**
**Claims priority, application Japan, Jun. 1, 1979, 54-74848[U]**
**Int. Cl.[3] H01H 9/00**
**U.S. Cl. 200—4** **8 Claims**



1. A switch unit comprising:

a support frame including a partition wall separating the interior of said frame into first and second chambers;

a first operating member mounted within said first chamber about a shaft member for pivotal movement between first and second positions, said first operating member having extending therefrom into said first chamber a first switch operating portion;

a second operating member mounted within said first operating member for movement therein in opposite linear directions between a first outer position and a second inner position, said second operating member being pivotal with said first operating member during movement thereof between said first and second positions thereof, said second operating member having at an inner end thereof a second switch operating portion and a sliding portion;

spring means for urging said second operating member to said first outer position thereof;

first and second switch mechanisms positioned within said second chamber;

first pin means, mounted for movement through said partition wall, and positioned to be depressed by said first switch operating portion upon movement of said first operating member from said first position thereof to said second position thereof for thereby actuating said first switch mechanism;

second pin means, mounted for movement through said partition wall, and positioned to be depressed by said second switch operating portion upon linear movement of said second operating member from said first outer portion thereof to said second inner position thereof, when said first operating member is in said second position thereof, for thereby actuating said second switching mechanism; and

cam surface means, provided on said partition wall and extending along the path of movement of said sliding portion during pivotal movement of said first operating member, and thereby of said second operating member, between said first and second positions thereof, for, upon linear movement of said second operating member from said first outer position thereof to said second inner position thereof when said first operating member is in said first position thereof, being slidably contacted by said sliding portion and thereby imparting pivoting movement to said second operating member and thus causing said first operating member to pivot to said second position thereof, thereby causing simultaneous depression of said

first and second pin means and actuation of said first and second switch mechanisms.

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**4,314,112**

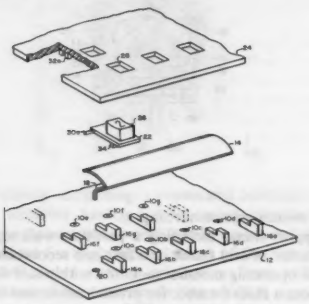
## KEYBOARD HAVING SWITCHES WITH TACTILE FEEDBACK

**William W. Misson, Santa Rosa; Clarence K. Studley, Los Altos; Bernard M. Oliver, Los Altos Hills, and Edward T. Liljenwall, Sunnyvale, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Division of Ser. No. 173,754, Aug. 23, 1971, Pat. No. 3,941,953. This application Jun. 10, 1974, Ser. No. 477,935**

**Int. Cl.³ H01H** *13/70*

**U.S. Cl. 200—5 A** **6 Claims**



**1.** A keyboard having a plurality of normally open contact switches, said keyboard comprising:

a circuit board having first and second sides;

a plurality of spaced first electrical contacts, each contact extending through said circuit board from said first side of said circuit board to said second side thereof and being electrically connected to selective circuits on said second side;

a plurality of second contacts, each formed as a curved resilient plate of electrically conductive material spaced from said first contact in a normally open position and having a peripheral edge along at least a portion of which said second contact is supported;

a contact support on said first side of said circuit board spaced from each of said first contacts and supporting said second contacts along at least a portion of their peripheral edges, said contact support being connectable to a potential, each of said switches completing a circuit upon deflection of the center of said plate from said normally open position to a closed position against a corresponding first contact when pressure is exerted against said center, said center snapping back to said normally open position upon removal of said pressure;

a plurality of depressible keys; and

means for positioning said keys with one of said keys adjacent each of said second contacts, each of said keys being selectively depressible to deflect a respective plate from said normally open position to a closed position.

**2.** A keyboard assembly comprising:

an electrically insulative base member having a plurality of fixed electrically conductive contact elements arranged in a predetermined pattern and adapted to be electrically coupled to associated circuit elements, each fixed contact element having a portion projecting in a first direction from said base member, said base member further including a plurality of contact regions;

a plurality of snap action diaphragm contact elements overlying said fixed contact elements, each said diaphragm contact element having a tine extending in a direction generally opposite said first direction to said base member and coupled to said contact regions;

electrical insulative means coupled to said base member for supporting said diaphragm contact elements and for limiting lateral movement thereof; and

means for flexing said diaphragm contact elements to enable contact with one of said fixed contact elements to provide an electrical switching function.

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**4,314,113**

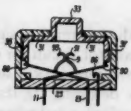
## KEYSWITCH HAVING CONTACTS MOUNTED ON CANTILEVER BEAMS

**Edward I. Nelson, Sunrise, Fla., assignor to Burroughs Corporation, Detroit, Mich.**

**Filed Jan. 21, 1980, Ser. No. 113,907**

**Int. Cl.³ H01H** *3/12*

**U.S. Cl. 200—5 R** **5 Claims**



**1.** A keyswitch, comprising:

a housing;

a plunger which is guided within said housing;

a pair of cantilever beams attached to said housing, said beams making springing contact with said plunger whereby putting pressure on said plunger results in deflection of said cantilever beams and removing pressure from said plunger causes said beams and said plunger to springably return to their rest positions; and

a pair of electrical contacts each attached to a respective cantilever beam such that when said beams are in their rest position said contacts touch one another and when said beams are deflected said contacts do not touch one another.

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**4,314,114**

## LAMINATED MEMBRANE SWITCH

**Willis A. Larson, Crystal Lake, Ill., assignor to Oak Industries, Rancho Bernardo, Calif.**

**Filed Feb. 4, 1980, Ser. No. 118,410**

**Int. Cl.³ H01H** *13/02*

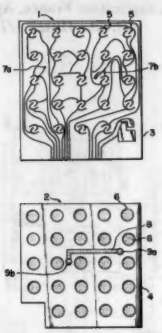
**U.S. Cl. 200—5 A** **8 Claims**

**1.** An assembly comprising a membrane switch including a composite of first and second layers which are substantially coextensive and are made of materials which are heat-bondable to each other, the composite being folded back upon said second layer and forming the outer members of said membrane switch, electrical conductors formed on the composite, and a spacer member made of material which is heat-bondable to said second layer, said spacer member having spaced openings therein and extending between the folded portions of the composite, said composite being heat and pressure bonded to the spacer.

## 4,314,115
## KEY-BOARD SWITCHING UNIT

Ryoichi Sado, Saitama, and Koichi Nei, Tokyo, both of Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1980, Ser. No. 133,663
Claims priority, application Japan, Jul. 4, 1979, 54-46393
Int. Cl.³ H01H *13/70*
U.S. Cl. 200—5 A 1 Claim



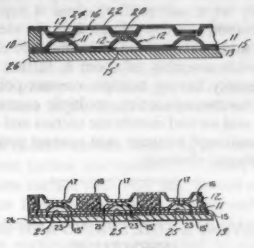
1. A key-board switching unit which comprises
(a) a printed circuit board made of an electrically insulating board provided on one surface thereof with a printed circuit pattern having a plurality of fixed contacts, said circuit pattern including at least two unconnected contacts, said circuit pattern being incomplete by the lack of at least one jumping connection across said unconnected contacts,
(b) a key-board covering pad made of an electrically insulating rubbery material provided on one surface thereof with a plurality of movable contacts at positions corresponding to the fixed contacts on the printed circuit board and at least one connection circuit on the same surface as the movable contacts at a position corresponding to said at least two unconnected contacts on the printed circuit board to directly connect said unconnected contacts, said covering pad being mounted on the printed circuit board in such a manner that each of the movable contacts faces respective one of the fixed contacts on the printed circuit board, and
(c) at least one spacer means positioned between the printed circuit board and the covering pad to form only a narrow interspace between the fixed contacts and the movable contacts and thereby not forming an interspace between said connection circuit and said unconnected contacts.

## 4,314,116
## KEYBOARD SWITCH WITH GRAPHIC OVERLAY

Herman B. Gordon, Tempe, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Jun. 23, 1980, Ser. No. 161,776
Int. Cl.³ H01H *13/70*
U.S. Cl. 200—5 A 8 Claims

1. In a switch having:
first contact means, said first contact means including a first conductive element being movable between first and second positions;
second contact means, said second contact means including a second conductive element aligned with and out of contact with said first conductive element when said first conductive element is in the first position, and said first conductive element being in contact with said second conductive element when said first conductive element is in the second position; and
flexible cover sheet means, said cover sheet means defining a planar surface having at least a first depression in alignment with and extending toward said contact means conductive elements and having a base portion, whereby flexing of the base portion of said depression toward said contact means will move at least one of said conductive elements toward the other and establish electrical contact between said first and second contact means conductive elements;
the improvement comprising:

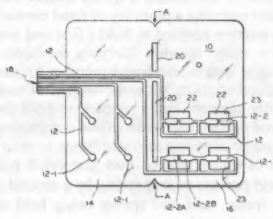


indicia bearing means for identifying a contact in said depression and supported by said base portion; and
transparent overlay means over said cover sheet means, said transparent overlay means having at least a first depression mating and nesting with said first depression in said cover sheet means.

## 4,314,117
## MEMBRANE CONTACT SWITCH

Albert F. Ditzig, Hoffman Estates, Ill., assignor to RE-AL, Inc., Wheeling, Ill.

Filed Jul. 24, 1980, Ser. No. 171,726
Int. Cl.³ H01H *13/70, 1/00*
U.S. Cl. 200—5 A 12 Claims



1. A contact switch assembly comprising:
a unitary sheet of flexible and resilient insulator membrane having a first and second section separated by a fold line and a tail section;
a switch circuit pattern supported by said membrane, said switch circuit having a contact point supported by said first membrane section and a contactor element supported by said second membrane section, said circuit patterns communicating with said contact point and contactor element terminating at said membrane tail section;
said first and second membrane section being folded upon themselves along said fold line whereby said contactor element supported by said second membrane section is positioned above and in registry with said contact point supported by said first membrane section;
means for electrically insulating the circuit pattern supported by said first membrane section from the circuit pattern supported by said second membrane section;
a resilient dome having upper and lower electrically conductive surfaces which are in communication with each other positioned between said contact point and said contactor element, said dome having a rest position wherein its

lower surface is not in electrical contact with said contact point and a flexed position wherein its lower surface is in electrical contact with said contact point;

means for maintaining said contactor element in electrical contact with the upper surface of said dome; and

means for maintaining said contact point and associated circuit pattern out of electrical contact with said dome when said dome is in its rest position, whereby the lower surface of said dome will electrically engage said contact point only when said resilient dome is depressed into its flexed position thereby completing the electrical circuit between said contact point and contactor element.

12. The switch assembly of claim 1, further comprising a keyboard assembly having multiple contact points supported by said first membrane section, multiple contactor elements supported by said second membrane section and multiple resilient domes positioned between said contact points and corresponding contactor elements.

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**4,314,118**

**SWITCH HAVING A COIL SPRING AND METHOD OF ASSEMBLING**

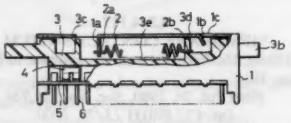
**Masao Ohkita, and Hitoshi Yamashita, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan**

**Filed Jun. 28, 1978, Ser. No. 919,800**

**Claims priority, application Japan, Jun. 28, 1977, 52-76797**

**Int. Cl.³ H01H *15/02, 11/00***

**U.S. Cl. 200—16 F** **4 Claims**




1. A method of assembling a spring loaded switch having a frame member carrying a plurality of fixed contacts and having a first catch portion adapted to hold a first end portion of a coil spring, and a slider member carrying movable contacts and adapted to slide within said frame member for engaging selectively said fixed contacts upon movement of said slider member, said slider member being adapted to hold the second end portion of said coil spring, said method comprising the steps of:

inserting said coil spring into said frame so as to hold one end portion of said spring by said first catch portion and the other end portion of said spring by a second catch portion of said frame, said coil spring being held under tension between said catch portions;

inserting said slider member into said frame; and thereafter

removing one end portion of said spring from its associated catch portion and securing it into engagement with said slider member.

3. A switch comprising:

a frame carrying a plurality of fixed contacts and having first and second catch portions extending inwardly from a wall portion of said frame;

a tension coil spring having a respective hook portion on each end thereof, one of said hook portions being held by said first catch portion;

a slider member carrying movable contacts and adapted to slide within said frame member for engaging selectively said fixed contacts upon movements of said slider member, said slider member having a projection adapted to engage the other of said hook portions to hold said spring under tension; and

an opening in said frame adjacent said second catch portion whereby during assembly of said switch, said coiled spring may be first held under tension by engaging its hook portions about respective catch portions of said frame and then a tool can be inserted through said opening to remove said other hook portion from the second catch portion and onto said projection for securing said spring under tension between said frame and said slider member.

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**4,314,119**

**CONTROL DEVICE FOR MOTOR-REDUCTION UNITS**

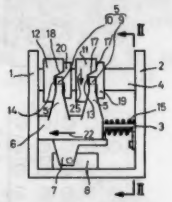
**Pierre Fillion, Ville la Grand, France, assignor to Etablissements Carpano & Pons, France**

**Filed Apr. 21, 1980, Ser. No. 142,050**

**Claims priority, application France, Apr. 25, 1979, 79 11205**

**Int. Cl.³ H01H *3/16***

**U.S. Cl. 200—47** **9 Claims**




1. A control device, comprising:

at least one cam having a circumferential cam surface, a circumferential shoulder surface recessed relative to said circumferential cam surface, and a notch surface defining a notch in said circumferential cam surface adjacent said circumferential shoulder surface and opening to said circumferential shoulder surface;

cam mounting means mounting said cam for rotation about an imaginary axis of rotation with said circumferential cam surface rotatable circumferentially about the imaginary axis of rotation;

a control member having a projection defining a cam follower dimensioned to ride on said circumferential cam surface and be received within said notch and ride on said circumferential shoulder surface; and

control member mounting means for pivotally and slidably mounting said control member to move said control member projection toward and away from said circumferential cam surface and generally parallel to the imaginary axis of cam rotation, said control member mounting means normally positioning said control member with said control member projection bearing against said circumferential cam surface, said control member pivoting to insert said control member projection into the notch in said circumferential cam surface when said cam rotates to bring said notch opposite said control member projection, and said control member sliding generally parallel to the imaginary cam axis of rotation along said notch surface as said cam rotates with said control member projection extending into said notch until said control member projection travels out of said notch onto said recessed circumferential shoulder surface to allow said cam to rotate beyond the position at which said control member projection extends into said notch.

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**4,314,120**

**SHOCK RESPONSIVE DEVICE**

**Mark B. Sharp, 19130 Sherman Way, Apt. 14, Reseda, Calif. 91335, and Robert E. Sharp, 19732 Vanowen St., Canoga Park, Calif. 91306**

**Filed May 8, 1980, Ser. No. 147,941**

**Int. Cl.³ F16K *17/36***

**U.S. Cl. 200—61.45 R** **11 Claims**

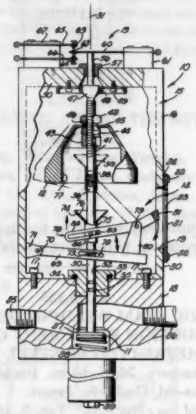
1. A shock responsive device comprising:

a first element yieldingly urged upwardly;

a weight structure above said first element displaceable by shock forces;

a universal connection above said first element suspending said weight structure in depending relation for universal pivotal movement between a normal position in which a lower portion of the weight structure blocks upward movement of said first element and laterally deflected positions releasing the first element for upward movement;

said universal connection including a ball connected to the



weight structure, and a socket structure disposed about the ball and supporting it for universal movement;

an additional element projecting upwardly above said ball and movable upwardly and downwardly relative thereto;

switch means actuable by said additional element; and

means forming a surface on said ball engageable with said element to deflect it upwardly in response to universal pivotal movement of the weight structure from said normal position.

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**4,314,121**

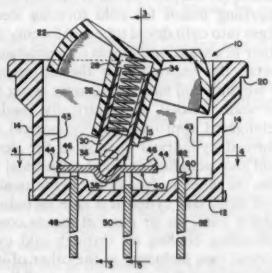
## SWITCH WITH SLIDING CONTACTOR

**Martin Gaber, Wilmette, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.**

**Filed Oct. 20, 1980, Ser. No. 198,676**

**Int. Cl.³ H01H *13/28***

**U.S. Cl. 200—67 G** **9 Claims**



1. In a switch construction comprising a plurality of opposed generally flat contacts, a sliding bridging contactor, actuator means for sliding said contactor relative to said contacts so that said contactor is shifted by said actuator means between a first position at which it completes a circuit by engaging two of said contacts and a second position at which said contactor is shifted out of engagement with at least one of said previously engaged contacts, wherein at least one of said opposed contacts comprises first and second engagement surfaces, the improvement wherein said contactor comprises a first contact surface means moveable into engagement with said first engagement surface and a second contact surface means moveable into engagement with said second engagement surface, which are located relative to each other so that;

(a) said first contact surface means contacts said first engagement surface before said second contact surface means contacts said second engagement surface, and said first contact surface means disengages from contact with said first engagement surface after said second contact surface comes into contact with said second engagement surface during closure of said circuit between said two contacts, and

(b) said first contact surface means again contacts said first engagement surface and remains in contact with said first engagement surface until after said second contact means disengages from contact with said second engagement surfaces during opening of said circuit, thereby confining the major portion of any arcing that occurs to said first contact surface means and said first engagement surface.

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**4,314,122**

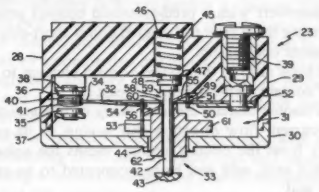
## CONTROL UNIT AND ELECTRICAL SWITCH CONSTRUCTION THEREFOR AND METHODS OF MAKING SUCH A CONTROL UNIT AND ELECTRICAL SWITCH CONSTRUCTION

**Werner R. Bauer, Radnor, and William N. Smith, Hatboro, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.**

**Division of Ser. No. 766,018, Feb. 7, 1977, Pat. No. 4,245,142, which is a continuation-in-part of Ser. No. 707,635, Jul. 22, 1976, Pat. No. 4,109,121. This application Feb. 11, 1980, Ser. No. 120,259**

**Int. Cl.³ H01H *13/22, 35/24***

**U.S. Cl. 200—72 A** **2 Claims**



1. An electrical switch construction comprising a housing means carrying a pair of spaced contact stops and a switch blade having a contact portion for being moved between said stops when said blade is moved overcenter, and a movable actuator means carried by said housing means for moving said blade overcenter in one direction when said actuator means is moved in one direction thereof and for moving said blade overcenter in the opposite direction thereof, said actuator means extending out of said housing means to thereby be accessible for operation external to said housing means, said actuator means including an actuator plunger, said actuator means including an actuator spring that is moved by movement of said actuator plunger, said actuator spring being operatively interconnected to said blade to move said blade as said actuator means is moved, said actuator means having a gap defined by a pair of spaced shoulders on said actuator means that are adapted to respectively engage said actuator spring, said actuator means including a sleeve movably carried by said housing means and being operatively associated with said plunger, said plunger having a stop part thereof that defines one of said shoulders, said sleeve defining the other of said shoulders whereby operation of said sleeve and said plunger allows

independent determination of the snap over points of said blade.

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**4,314,123**

## CURRENT FEED FOR A SUPER-CONDUCTING MAGNET COIL

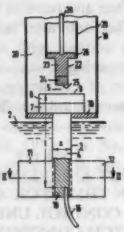
**Hans Hieronymus, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Filed Dec. 27, 1979, Ser. No. 107,713**

**Claims priority, application Fed. Rep. of Germany, Jan. 18, 1979, 2901892**

**Int. Cl.³ H01H *1/62***

**U.S. Cl. 200—289** **13 Claims**



1. In a current feed for a superconducting magnet coil which is cooled by a cryogenic medium and the coil ends of which can be short circuited by a continuous current switch, with a disconnecting device at each coil end which comprises a stationary contact member which is connected to the respective coil end and is included in the cooling effect of the cryogenic medium, a movable contact member connected to a current supply, and a mechanical actuating device for joining the contact members with a predetermined contact pressure and for separating them after the magnet coil is short-circuited, the improvement comprising:

(a) the mass ratio of the cooled contact element to the movable contact element being at least 5:1;

(b) the cooled contact element being of elongated shape in the current flow direction and having, at its end facing away from the contact region, means for enlarging the surface area, said end being connected to an end of the coil; and

(c) the thermal resistance of the cooled contact element between the contact region and the connection point of the coil end being at least 0.2 kelvin per watt for each 1000 amperes of current maximally to be transmitted.

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**4,314,124**

## PUSHBUTTON CONTACT

**Heinrich Sauer, Amberg, and Herbert Müller, Schwarzenfeld, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Filed Nov. 19, 1979, Ser. No. 95,332**

**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853880**

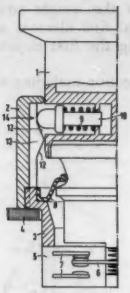
**Int. Cl.³ H01H *9/00***

**U.S. Cl. 200—328** **8 Claims**

1. A push button contactor which is adapted to be changed from a contacting function to a locking function and vice versa comprising:

a support carrying at least first and second cam surfaces each having a different profile; and

an actuating member adjacent to the support and carrying at least one detent means, the actuating member being displaceable between operating positions through at least one



predetermined angle to bring the detent means into operating engagement with either one of the cam surfaces.

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**4,314,125**

## ELECTRIC SEAM WELDING DEVICE IN THE PRODUCTION EQUIPMENT OF HOT-DIP METAL-COATED STEEL TUBES

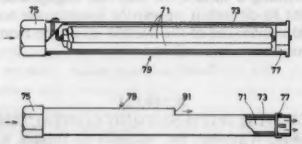
**Matsuichi Nakamura, 26, 5-chome, Itachibori-minamidori, Nishi-ku, Osaka-shi, Osaka-fu, Japan**

**Continuation of Ser. No. 9,443, Feb. 5, 1979, abandoned. This application Sep. 9, 1980, Ser. No. 185,881**

**Claims priority, application Japan, May 13, 1978, 53/14173**

**Int. Cl.³ H05B *6/14***

**U.S. Cl. 219—8.5** **2 Claims**



1. Apparatus for the production of hot-dip metal-coated steel tubes comprising means for cold forming steel strip having parallel edges into cylindrical tube and forcing the edges of the strip together in a seam, and means for immersing the tube into molten metal, the improvement therein comprising a high frequency welding coil means extending about the areas of the strip to be seam welded, an electrically insulating and heat resisting elongated approximately cylindrical case extending into the formed cylindrical portion of the steel strip at said welding coil and including an outer cylindrical surface closely spaced from the inner surface of the cylindrical portion of the formed steel strip, said cylindrical case including at one of its end portions a joint, an air conduit means connected to said joint for directing cooling air through said cylindrical case, said cylindrical case including at the other of its end portions an air outlet opening for exhausting the cooling air from said cylindrical case into the formed cylindrical portion of the steel strip at a position beyond the welding coil, said cylindrical case including a second air outlet opening at a position for directing a flow of the cooling air from said cylindrical case into the gap between the edges of the formed cylindrical portion of the steel strip to cool the edges of the steel strip and to blow away the iron dust appearing on the inner surface of the formed cylindrical portion of the steel strip at the welding point, a

plurality of elongated ferrite cores each contained in and extending along substantially the full length of said cylindrical case and arranged in a bundle with respect to one another and disposed parallel to said cylindrical case and occupying a major portion of the diameter of said cylindrical case, and means for supplying air to said conduit means whereby the air flows into said cylindrical case and along and about said ferrite cores of the bundle of cores and then out the air outlet openings of said case and into the formed cylindrical portion of the steel strip to cool the case, cores and formed steel strip without hazard of explosion and into the gap between the edges of the steep strip to remove the iron dust from the formed steel strip.

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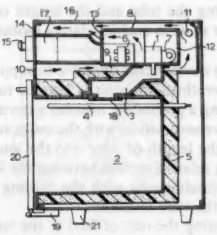
**4,314,126**

## MICROWAVE HEATING APPARATUS WITH COOLING CONDUIT

**Hirofumi Yoshimura, Nara; Junzo Tanaka, Fujiidera, and Nobuo Ikeda, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

**Continuation-in-part of Ser. No. 47,996, Jun. 13, 1979, abandoned. This application Jul. 30, 1979, Ser. No. 62,241**
**Claims priority, application Japan, Jun. 13, 1978, 53-71699**
**Int. Cl.³ H05B** *6/64*
**U.S. Cl. 219—10.55 R** **2 Claims**



1. A microwave heating apparatus comprising:
a body having a front wall and a top wall;
a heating chamber within said body for holding an object to be heated and having a microwave inlet in the top thereof;
a microwave source for generating microwaves and having high voltage circuit components associated therewith;
a wave guide connected between said microwave source and said microwave inlet for guiding the microwaves from said microwave source to said heating chamber;
a radiant energy heating means disposed within said heating chamber for heating the object to be heated by radiant energy;
a power box above said chamber and housing said microwave source and the high voltage circuit components, the top surface of said power box being spaced from said top wall to define a top cooling conduit along the top of said power box;
a microwave source cooling fan in said power box;
thermal insulation covering the walls of said heating chamber, the upper surface of said thermal insulation on the top of said chamber and the bottom surface of said power box being spaced to provide a bottom cooling conduit along the bottom of said power box, the front wall of said body having an air suction inlet therein opening only into one end of said bottom cooling conduit; and
a power box cooling fan at the other end of said bottom cooling conduit and discharging into said top cooling conduit, said top cooling conduit having a discharge opening at the end remote from said power box cooling fan, said power box having a suction port therein at the other end of said bottom cooling conduit and opening into said cooling conduit upstream of said power box cooling fan for admitting air from said cooling conduit into said power box, and said power box having a discharge port at the end remote from said suction port communicating with said top cooling conduit, said microwave source cooling fan and said power box cooling fan being in parallel flow relation.

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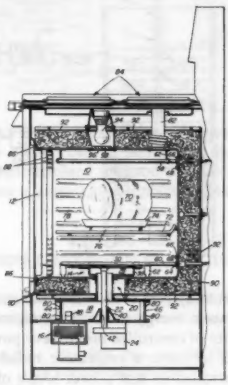
**4,314,127**

## MICROWAVE OVEN WITH ROTATING MULTIPORT RADIATOR

**Bernard J. Weiss, Barto, Pa., assignor to Raytheon Company, Lexington, Mass.**

**Continuation of Ser. No. 847,863, Nov. 2, 1977, abandoned. This application Oct. 24, 1979, Ser. No. 94,135**
**Int. Cl.³ E05B** *6/72*
**U.S. Cl. 219—10.55 F** **11 Claims**



1. A microwave heating apparatus comprising:
a substantially rectangular conductive enclosure having an aperture in a wall thereof;
a source of microwave energy outside said enclosure;
a primary radiating structure having a chamber formed by spaced first and second surfaces, said first surface having a hole therein, said structure being supported in said enclosure by a conductive rod extending into said enclosure through said aperture, said rod extending through said hole and contacting said second surface for supporting said structure;
a conductive cylinder positioned concentric with said rod and extending from said aperture into said chamber for providing a coaxial transmission line in combination with said rod for coupling said microwave energy to said chamber;
means for rotating said primary radiating structure about the axis of said rod;
and said primary radiating structure comprising a plurality of radiators for radiating simultaneous beams of said microwave energy, said beams having differently oriented polarization vectors in a plane substantially perpendicular to said axis.

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**4,314,128**

## SILICON GROWTH TECHNIQUE AND APPARATUS USING CONTROLLED MICROWAVE HEATING

**Sanjeev R. Chitre, Reseda, Calif., assignor to Photowatt International, Inc., Tempe, Ariz.**

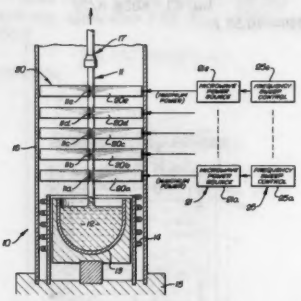
**Filed Jan. 28, 1980, Ser. No. 115,952**
**Int. Cl.³ H05B** *6/80, 6/72;* **C30B** *15/20*
**U.S. Cl. 219—10.55 B** **15 Claims**

1. A method for the control of thermal gradients in crystal pulling, comprising:
heating by microwave energy the crystal being pulled at a series of positions increasing in distance from the melt from which the crystal is formed, and
controlling said microwave heating at each position so as to

produce a substantially uniform temperature laterally across the crystal at said position, the uniform temperatures decreasing step-wise at successive positions with increasing distance from the melt.

10. An apparatus for controlling thermal gradients in the growth of a crystal being pulled by a puller from a melt, comprising:

a plurality of microwave radiators arranged linearly along the direction of pulling by said puller so that said crystal



will sequentially pass each of said radiators and be heated by microwave energy radiated thereform, and

a like plurality of controlled microwave power sources each connected to drive a respective radiator, said sources being controlled so that power levels of microwave energy from said radiators progressively decrease with increasing distance of said radiators from said melt, the frequency of individual power sources being swept through a range of frequencies to achieve by said heating a certain lateral temperature distribution in said crystal.

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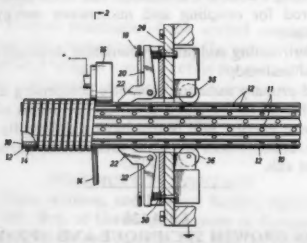
**4,314,129**

## METHOD AND APPARATUS FOR MAKING WELL SCREEN

**Hill D. Wilson, and Norman R. Corgey, both of Houston, Tex., assignors to Houston Well Screen Company, Houston, Tex.**

**Filed Feb. 12, 1979, Ser. No. 11,035**
**Int. Cl.³ B23K *11/00***
**U.S. Cl. 219—58** **7 Claims**



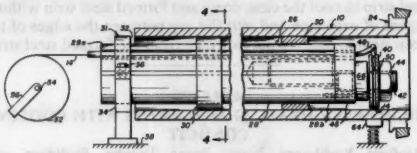
1. A method of making a rod-based screen in place on a perforated pipe base comprising the steps of mounting a perforated pipe for rotation around its longitudinal axis positioning a plurality of rods along the outer surface of the pipe rotating the pipe and the rods to wrap a wire in spaced helical coils around the pipe and the rods, welding the wire to the rods as the wire engages the rods, and grounding each individual rod ahead of the wrapped wire through a separate individual contact that engages only said individual rod on the outside surface of the rod adjacent the wire.

**4,314,130**

## METHOD OF MAKING VARIABLY RIFLED TUBES

**Thomas L. Mabery, East Ridge, and Francis B. Jackson, Chattanooga, both of Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.**

**Filed Sep. 10, 1979, Ser. No. 73,969**
**Int. Cl.³ B21D *53/06*; B23K *11/32***
**U.S. Cl. 219—58** **4 Claims**



1. A method of providing a tube with a predetermined pattern of variable rifling for purposes of imbuing the tube with the requisite heat transfer characteristic comprising the steps of:

(a.) providing a tube to be furnished with variable rifling;

(b.) providing a length of wire to be affixed to the inner wall of the tube;

(c.) supporting the tube and the length of wire relative to each other so as to enable relative motion to be had therebetween;

(d.) inserting a conductor operable to supply welding power energy therethrough into the interior tube:

(e.) supporting a grounding member externally of the tube in cooperative association with the outer surface of the tube;

(f.) feeding the length of wire into the interior of the tube;

(g.) effecting relative motion between the length of wire and the tube simultaneous with the feeding on the length of wire into the tube interior;

(h.) coordinating the rate of feed of the length of wire with the relative motion occurring between the length of the wire and the tube;

(i.) configuring the length of wire into the form of the pattern of variable rifling required to provide the tube with the desired heat transfer characteristics as the length of wire is being fed into the tube interior, by virtue of the coordination effected between the rate of feed of the length of wire and the relative motion occuring between the length of wire and the tube;

(j.) supplying welding power energy through the conductor to weld the length of wire in the form of the requisite pattern of variable rifling to the inner wall of the tube by establishing a continuous weld between the length of wire and the tube inner wall;

(k.) withdrawing the conductor from the interior of the tube after length of wire has been welded to the inner wall of the tube; and

(l.) removing the grounding member from cooperative association with the outer surface of the tube.

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**4,314,131**

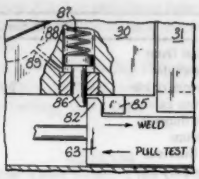
## METHOD OF BAND WELDING WITH WELD TESTING

**George R. Fryer, Ansonia, Conn., assignor to Fryer Corporation, Oxford, Conn.**

**Division of Ser. No. 860,873, Dec. 15, 1977, Pat. No. 4,208,565. This application Nov. 26, 1979, Ser. No. 97,544**
**Int. Cl.³ B23K *9/225***
**U.S. Cl. 219—58** **2 Claims**

1. A method of banding articles with wire comprising the steps of passing a wire having a leading end about the articles, clamping the leading end in a first clamping member, severing the length to be banded and clamping the severed end in a second clamping member, moving the second member to bring said ends into position for welding, welding the ends together,

allowing the weld to cool, moving one of said clamping members to exert a tensional force on the wire between the points




of clamping across the weld, and thereafter releasing the clamps.

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**4,314,132**

## ARC WELDING CUPRO NICKEL PARTS

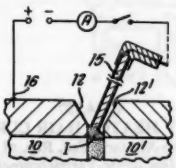
**Ronald Porter, Wirral, England, assignor to Grootcon (U.K.) Limited, England**

**Filed May 25, 1979, Ser. No. 42,558**

**Claims priority, application United Kingdom, May 30, 1978, 24337/78**

**Int. Cl.³ B23K** *9/225*

**U.S. Cl. 219—61** **29 Claims**




1. A method for welding together a pair of cupro-nickel parts, comprising the steps of providing a substantially symmetrical open V butt joint between said parts, said joint including first and second divergent faces on the respective parts, a first root face continuing said first divergent face and a second root face continuting said second divergent face, each of said first and second root faces having a mean width greater than 1.5 mm and not greater than 3.2 mm and said first and second root faces being substantially parallel and separated by a root gap of from 2 mm to 3 mm; root-welding said first root face to said second root face using a flux-coated stick electrode of from 1.6 mm to 2.2 mm diameter applied solely from the wide-mouthed side of said open V butt joint without employing inert gas shielding, backing material or subsequent welding at the opposite side of said open V butt joint; and subsequently cap-welding said divergent faces.

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**4,314,133**

## PROCESS AND APPARATUS FOR ELECTRICAL DISCHARGE MACHINING BY MEANS OF A WIRE ELECTRODE

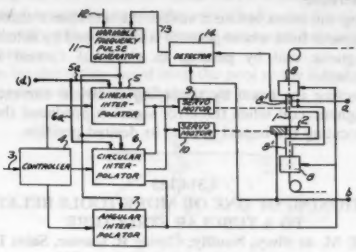
**Jean Pfau, Collonge-Bellerive, and Alain Wavre, Geneva, both of Switzerland, assignors to Ateliers des Charmilles S.A., Geneva, Switzerland**

**Continuation-in-part of Ser. No. 843,431, Oct. 19, 1977, abandoned. This application Feb. 7, 1980, Ser. No. 119,549**

**Int. Cl.³ B23P** *1/12*

**U.S. Cl. 219—69 M** **5 Claims**

1. A method for machining by electrical discharges an electrode workpiece by means of an electrode wire fed longitudinally between two wire support and guide members, wherein the motion of the electrodes one relative to the other along a pair of coordinate axes is controlled in such a manner as to cut in the workpiece a desired path of predetermined shape and wherein said electrode wire is subjected to deformation during machining causing a displacement of the cutting path relative to said desired path in a direction generally opposite to the direction of said path, said method comprising displacing relative to the workpiece at least one of the electrode wire support




and guide members along a corrected path obtained by shifting each point of the desired cutting path in the direction of the cutting path a predetermined distance corresponding to said displacement along a tangent at said point to said cutting path.

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**4,314,134**

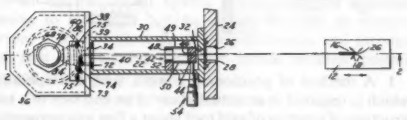
## BEAM POSITION CONTROL FOR ELECTRON BEAM WELDER

**Berthold W. Schumacher, and John C. Cooper, both of Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Nov. 23, 1979, Ser. No. 96,864**

**Int. Cl.³ B23K** *15/00*

**U.S. Cl. 219—121 EW** **18 Claims**



1. A device for controlling the position of an electron beam impact spot at a reference position on a workpiece comprising:

first aperture means mounted for adjustable movement, directed toward the reference position so that X-rays emanating from the impact spot may pass through said first aperture means, which together with the reference position defines a plane;

second aperture means moveable into and out of alignment with the defined plane, whereby X-rays that pass through said first aperture means may pass through said second aperture means when such alignment is effected;

means responsive to the X-rays that pass through said second aperture means for producing an error signal indicative of the dislocation of the impact spot from the reference position; and

means responsive to the error signal for moving the position of the impact spot to the reference position.

16. The method of controlling the position of a beam of charged particles that strikes a workpiece at an impact spot on a seam:

and moving the workpiece under the beam;

passing X-rays emanating from the impact spot first through a first aperture then through a moving aperture;

producing a first electrical pulse when X-rays emanating from the impact spot pass through the moving aperture;

producing a second electrical signal when the moving aperture moves to a second position;

producing a third electrical signal when the moving aperture moves to a third position;

establishing an electrical error signal when the difference in

duration of a first interval extending between the occurrences of the first and second pulses and the duration of a second interval extending between the occurrences of the second and third pulses is greater than a predetermined difference;

passing the beam before it strikes the workpiece through a magnetic field whose polarity is determined by actuating a magnetic coil by passing an electrical current therethrough;

redirecting the beam by supplying electrical current to a magnetic coil when the error signal is produced thereby relocating the impact spot to its desired position.

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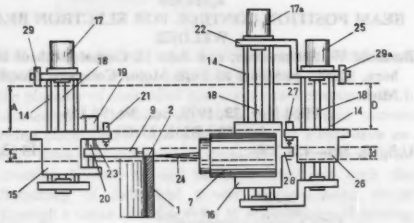
## 4,314,135
## POSITIONING OF ONE OR MORE TOOLS RELATIVE TO A TUBULAR STRUCTURE

**Bruno J. M. de Sivry, Neuilly; Claude R. Carsac, Saint Leu la Foret, and Jean-Pierre Hamon, Saint Ouen L'Aumone, all of France, assignors to Compagnie Francaise des Petroles, Paris, France**

**Filed Nov. 29, 1979, Ser. No. 98,441**
**Claims priority, application France, Nov. 29, 1978, 78 33661**
**Int. Cl.³ B23K** *15/00*
**U.S. Cl. 29—121 EU** **11 Claims**




1. A method of positioning a work tool, the operation of which is required in an actual plane of an end face of a tubular structure of rotation of said tool about a first axis perpendicular to said actual plane, said first axis having an angular deviation from an axis of said tubular structure, said method comprising defining an imaginary plane by defining three points by means of sensors connected to a support, said points being angularly spaced from one another, said imaginary plane being parallel with said support and being initially capable of having an angular deviation from said actual plane of said end face of said tubular structure, bringing said imaginary plane near said actual plane of said tubular structure by a displacement in a direction substantially parallel to said axis of said tubular structure, and then pivotting said support and said imaginary plane about predetermined pivotting axes until said three points defining said imaginary plane are all located insaid actual plane of said end face of said tubular structure, said work tool being connected to said support.

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## 4,314,136
## TUBULAR COMPOSITE ARC WELDING ELECTRODE FOR VERTICAL UP WELDING OF STAINLESS STEEL

**Damian J. Kotecki, Spring Garden Township, York County, Pa., assignor to Teledyne Industries, Inc., Los Angeles, Calif.**

**Filed Apr. 16, 1980, Ser. No. 140,825**
**Int. Cl.³ B23K** *35/30*
**U.S. Cl. 219—146.23** **3 Claims**

1. In a tubular composite arc welding electrode comprising a metallic outer sheath and a core within and enclosed by the sheath, of the type wherein the sheath and the metallic portion of the core are balanced to produce a stainless steel weld deposit, the improvement which comprises providing a nonmetallic portion of the core which consists essentially of a slag mix constituting from 6 to 15 weight percent of the electrode, the slag mix containing the following listed components in the proportions stated:

| | Weight percent of Slag Mix |
|---|---|
| Arc stabilizer selected from potassium titanate, sodium titanate and alkali metal oxide | up to 15 |
| Fluoride selected from calcium fluoride, magnesium fluoride, sodium fluoride, lithium fluoride, aluminum fluoride, potassium silicofluoride, and cryolite | up to 50 |
| Silicon dioxide | up to 10 |
| Zirconium dioxide | 15 to 60 |
| Titanium dioxide | balance. |

whereby the electrode operates satisfactorily in vertical up welding.

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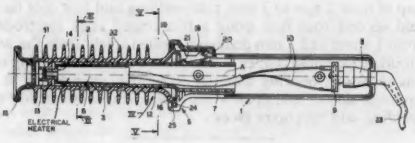
## 4,314,137
## ELECTRICALLY HEATED HAIR CURLING BRUSH

**Klaus Dörn, Mülheim-Mintard, Fed. Rep. of Germany, assignor to Wik-Elektro-Hausgeräte-Vertriebsgesellschaft mbH Produktionskom-Manditgesellschaft, Essen, Fed. Rep. of Germany**

**Filed Mar. 27, 1979, Ser. No. 24,444**
**Claims priority, application Fed. Rep. of Germany, Jan. 27, 1979, 2903105**
**Int. Cl.³ A46D** *7/10;* **A45D** *2/36;* **H05B** *1/00*
**U.S. Cl. 219—222** **10 Claims**




1. A device for drying and styling hair, said device comprising:

an elongated housing defining a longitudinal axis and having a front housing end and a rear housing end;

an inner tube fixed nonrotatably to said housing and extending axially from said front housing end;

an outer tube engaged over said inner tube, having an end close to said housing formed with an array of radially directed teeth and formed as a hairbrush;

means including cooperating formations on said tubes and housing for rotation of said outer tube on said inner tube about said axis, one of said formations being a circumferential rim formed on said housing and engaging around said teeth;

locking means including a detent on said housing displaceable radially between a locking position engaging between

said teeth and preventing rotation of said outer tube on said inner tube about said axis and a freeing position clear of said teeth and permitting such rotation;

an electrical heater fixed in said inner tube and in heat-transmitting engagement therewith and therethrough with said outer tube; and

means including a wire extending through said housing and to said heater for electrically energizing same and thereby conductively heating said tubes.

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**4,314,138**

## APPARATUS FOR APPLYING A MIXTURE OF AIR AND VAPOR TO THE FACE OR HAIR

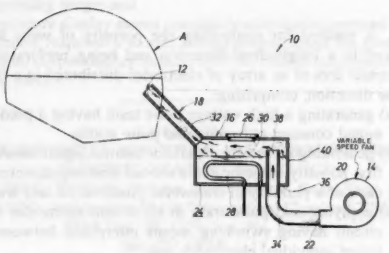
**Akira Itoh, 185, Namase 1188, Shiose-Cho, Nishinomiya-City, Hyogo, Japan**

**Filed Jun. 18, 1979, Ser. No. 49,388**

**Claims priority, application Japan, Jul. 14, 1978, 53-97431[U]**

**Int. Cl.³ A45D** *20/00;* **A61H** *33/06;* **F22B** *1/28;* **H05B** *1/00*

**U.S. Cl. 219—276** **3 Claims**




1. A hairdressing apparatus comprising:

a fan means having an inhaling entrance and an exhaling exit for inhaling relatively cool dry external air through said inhaling entrance and blowing said cool dry external air from said exhaling exit;

an attachment which can be fitted upon some portion of the body of a person in hairdressing or beauty treatment;

a communicating passage which connects the attachment with the exhaling exit of the fan and has an exhaust opening in the attachment; and

an evaporator mounted in an intermediate portion of the communicating passage and positioned substantially lower than the exhaust opening but substantially higher than the exhaling exit of the fan, said evaporator including a closed-type tank for partially containing water so that a residual space is left above the water and an electric heater means mounted for heating said water;

said communicating passage being composed of a first communicating tube which connects the attachment with the residual space in the closed-type tank and which slopes downwardly toward the residual space and a second communicating tube which connects the residual space with the exhaling exit of the fan and which slopes upwardly toward the residual space.

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**4,314,139**

## ELECTRIC BOILER HAVING MEANS FOR CONTROLLING STEAM GENERATION

**Stanley A. Williams, Dorset, England, and Allen R. Tesch, Hubertus, Wis., assignors to Aqua-Chem, Inc., Milwaukee, Wis.**

**Filed Jul. 25, 1979, Ser. No. 60,788**

**Int. Cl.³ H05B** *3/60;* **F22B** *1/30*

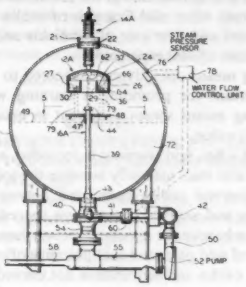
**U.S. Cl. 219—285** **22 Claims**

1. An electric boiler having a vessel for containing a pool of electrically conductive liquid in the lower end thereof, said vessel including a steam outlet,

first electrode means disposed within said vessel and adapted to be connected to a high voltage source,

second electrode means spaced from and below said first electrode means and above the expected level of the liquid in said pool, said second electrode means including liquid projecting means for projecting electrically conductive liquid upwardly onto said first electrode means in a first continuous stream,

means for delivering liquid from the pool to the liquid projecting means of said second electrode means,




said first electrode means including liquid receiving means for receiving and collecting the liquid from said first stream and for redirecting the same back downwardly onto said second electrode means in at least one additional continuous stream separate from said first stream and in electrical parallelism therewith,

said second electrode means being adapted to be connected into an electric circuit having a low electrical potential relative to said high voltage source whereby an electric current will flow through said liquid streams and through said first and second electrode means without passing through said pool of liquid.

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**4,314,140**

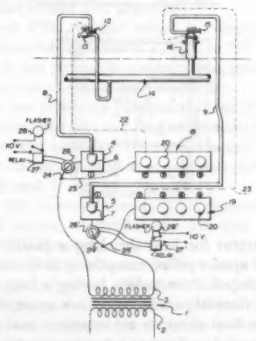
## PIPE THAWING APPARATUS

**Douglas B. Hughes, Rideau Ferry, Ontario, Canada**

**Filed Apr. 9, 1979, Ser. No. 28,325**

**Int. Cl.³ H05B** *1/02;* **F24H** *1/14*

**U.S. Cl. 219—300** **10 Claims**




1. An apparatus for heating electrically conductive pipes electrically by passing an electric current through said pipes, comprising:

a source of low voltage, high current power;

means for varying said current;

a pair of terminals connected across said source of power;

at least one other pair of terminals connected across said source of power;

a pair of electrical cables adapted for selective electrical interconnection of said pair of terminals to two respective spaced locations of a pipe to be heated;

a plurality of other pairs of electrical cables adapted for selective electrical interconnection of said at least one of other pair of terminals to said two respective spaced locations of said pipe;

current sensing means arranged so as to sense the current flowing in at least one of the terminals of said first pair of terminals when said first pair of cables in interconnected between said first pair of terminals and said two spaced locations of said pipe; and

warning means operatively connected to said current sensing means for providing a warning when said current sensing means senses a current in excess of a predetermined value;

wherein when said warning is provided, an operator of said apparatus shall manually increase the total number of pairs of electrical cables connected between said source of power and said two respective spaced locations of said pipe, whereby the maximum power handling capability of each of said pairs and said plurality of other pairs of electrical cables and terminals is not exceeded.

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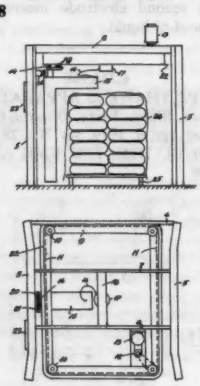
**4,314,141**

## APPARATUS FOR HEAT SHRINKING A PLASTIC FILM AROUND GOODS STACKED ON A PALLET

**Arne Vangsted, and Ejner V. Sorensen, both of Norre Aby, Denmark, assignors to Lip Bygningsartikler A/S, Norre Aby, Denmark**

**Filed Dec. 10, 1979, Ser. No. 101,609**
**Claims priority, application Denmark, Dec. 13, 1978, 5584/78**
**Int. Cl.³ B65B *53/02***
**U.S. Cl. 219—348** **4 Claims**



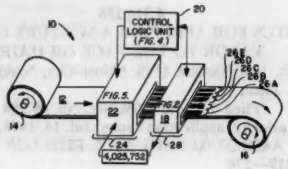
1. An apparatus for heat shrinking a plastic film around goods stacked upon a pallet, comprising an inverted L-shaped carrier of U-shaped cross-section having a long vertical part and a short horizontal part in the hollow space of which electrical radiation heat elements are mounted, said carrier being movably suspended, and means being provided for making the carrier perform a quadrangular movement around a pallet with stacked goods covered by a hood made from shrinkable plastic film, and means serving to make the carrier turn 90° around a vertical axis when passing a corner in the quadrangular movement, so that the horizontal part of the inverted L-shaped carrier will always extend inward over the stacked goods during the movement.

**4,314,142**

## SPATIALLY DISTRIBUTED ELECTROSTATIC PERFORATION OF MOVING WEBS

**William D. Brown, Brevard, and Hobart A. Whitman, III, Asheville, both of N.C., assignors to Olin Corporation, Pisgah Forest, N.C.**

**Division of Ser. No. 32,332, Apr. 23, 1979, Pat. No. 4,253,010.**
**This application Jul. 22, 1980, Ser. No. 171,110**
**Int. Cl.³ H05B *7/18***
**U.S. Cl. 219—384** **7 Claims**




1. A method for controlling the porosity of webs being moved in a longitudinal direction and being perforated by electrical arcs of an array of electrodes distributed in a transverse direction, comprising:

(a) generating a high voltage pulse train having a predetermined constant pulse rate and pulse width;

(b) generating a porosity difference control signal between a first porosity detector and a second porosity detector for each of a plurality of transverse positions on said web;

(c) applying said pulse train to all of said electrodes via a circuit having switching means interposed between selected individual electrodes; and

(d) utilizing said porosity difference control signals to selectively actuate said switching means.

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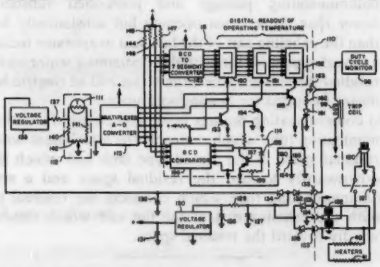
**4,314,143**

## BLOOD WARMING APPARATUS WITH DIGITAL DISPLAY AND MONITORING CIRCUIT

**Arnold C. Bilstad, Deerfield, and John T. Foley, Wheeling, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Jun. 29, 1979, Ser. No. 53,547**
**Int. Cl.³ H05B *1/02***
**U.S. Cl. 219—497** **8 Claims**




1. Fluid warming apparatus for heating a refrigerated fluid such as blood to a predetermined nominal temperature, comprising:

a housing defining a heating chamber for the fluid

means including at least one electric heater element operable from an applied electric current in thermal communication with the fluid in said heating chamber for heating the fluid as it passes through the chamber;

control circuit means responsive to the output temperature of the fluid for generating a heater control signal;

switch circuit means electrically connected between said heat-

ing element and a source of electrical current, and responsive to said heater control signal, for controlling the application of current to said heating element to maintain the fluid at said predetermined nominal temperature;

temperature sensing means for generating an analog output signal indicative of the output temperature of said fluid, said temperature sensing means including an output terminal, a constant current source, a thermistor in thermal communication with said fluid at the output of said heating chamber, and first and second resistances; said constant current source being connected to one terminal of said thermistor and being connected to a plane of reference potential through said first resistance; said output terminal being coupled to said other terminal of said thermistor and being connected to said plane of reference potential through said second resistance, the sum of said first and second resistances being selected to substantially linearize the temperature-voltage characteristic of said analog output signal at said output terminal over a predetermined temperature range, the ratio of said resistances being selected to provide a desired voltage level on said output terminal at a selected temperature within said operating range; and

temperature display means coupled to said output terminal and linearly responsive to said analog output signal for producing an output display indicative of the output temperature of the fluid.

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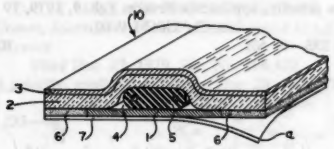
**4,314,144**

## THERMOSTAT MOUNTING ARRANGEMENT FOR ELECTRIC HEATING APPLIANCE

**Rudolph G. Wojtecki, Mantua, and Joseph P. Kaan, Stow, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio**

**Filed Oct. 29, 1979, Ser. No. 89,651**
**Int. Cl.³ H05B 3/34**
**U.S. Cl. 219—528** **6 Claims**




1. An elongate flexible heating package having sufficient flexibility to conform to an item to be heated to which the package is to be secured and adapted to contain and improve the heating efficiency of an elongate, electrically insulated, electrical heating element, contained within the package, said package comprising;

a first layer comprising a wall made from a flexible heat conductive material extending between a pair of spaced-apart edges that extend longitudinally along the length of the package,

a second layer comprising a wall made from a flexible heat insulative material extending between a pair of spaced-apart edges that extend longitudinally along the length of the package, said second layer secured to the side of said first layer that faces away from the item with said first layer being narrower in width than said second layer to provide a pair of spaced-apart spaces extending along the length of the package between said edges of said first and said second layers,

a third layer comprising a wall made from a flexible heat resistant material that is secured to the side of said second layer that faces away from said first layer, said third layer adapted to protect said second layer,

a layer of heat resistant adhesive disposed in said spaces along the length of the package, said adhesive adapted to secure the heating package to the item,

an elongated cavity disposed along the length of the package between a portion of said first layer and a portion of the composite wall comprising said second and said third layers, said cavity containing said electrical heating element and having opened ends and a cross-sectional configuration that permits the heating element to be axially inserted into and be removed from the cavity for replacement and repair without having to remove the package from the item, and a release strip disposed along the length of the package on the side of the package on the side of said first layer and said adhesive layers that face away from said cavity, said release strip made from a material adapted to enable the package to be conveniently handled and stored without the package becoming adhered to itself prior to securing the package to the item and able to be pulled away from said first layer and said adhesive layers during the process of securing the package thereto.

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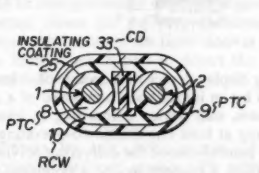
**4,314,145**

## ELECTRICAL DEVICES CONTAINING PTC ELEMENTS

**David A. Horsma, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.**

**Continuation-in-part of Ser. No. 873,676, Jan. 30, 1978, Pat. No. 4,246,468. This application Feb. 1, 1979, Ser. No. 8,617**
**The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.**
**Int. Cl.³ H05B 3/10**
**U.S. Cl. 219—553** **4 Claims**




1. An elongate electrical device which has a substantially constant cross-section along its length and which comprises

(a) a first electrode which is connectable to a source of electrical power;

(b) a second electrode which is connectable to a source of electrical power;

(c) a first PTC element which is composed of a PTC composition having a useful $T_s$ of 0° to 280° C. and which surrounds and physically contacts substantially the whole of the surface of said first electrode;

(d) a second PTC element which is composed of a PTC composition having a useful $T_s$ of 0° to 280° C. and which surrounds and physically contacts substantially the whole of the surface of said second electrode;

(e) at least one relatively constant wattage (RCW) element which surrounds said said first and second electrodes and said first and second PTC elements and which makes physical contact with each of said first and second PTC elements; and

(f) at least one current-directing (CD) element between said first and second electrodes and between said first and second PTC elements;

wherein when said first and second electrodes are connected to a source of electrical power while the whole device is below its operating temperature, current passes between the electrodes and either immediately or after an initial period of not more than 5 seconds the path of maximum current density passes through each of said first and second PTC elements and at least one RCW element, with the resistance of that current path being greater than the resistance of the current path which would be adopted if the CD element between said first and second electrodes and between said first and second PTC elements were replaced by an element of the same composition as that RCW element.

**4,314,146**

## ANALOG DISPLAY DEVICE

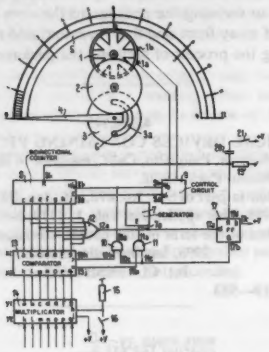
**Jean-Claude Berney, Chemin du Bois de Menton, 1066 Epalinges, Switzerland, assignor to Jean-Claude Berney, Epalinges, Switzerland**

**Filed Nov. 13, 1979, Ser. No. 93,925**

**Claims priority, application Switzerland, Nov. 21, 1978, 11903/78**

**Int. Cl.³ G01R 1/30**

**U.S. Cl. 235—92 EA** **17 Claims**



1. Analog display device of the value of at least one function represented by an information composed of a certain number of logic states, said device comprising at least one stepping motor driving at least one needle co-operating with a graduated dial, a control circuit for delivering driving pulses to the stepping motor, a counter having a counting capacity corresponding to the number of steps required for the needle to reach the end of the scale on the dial, first means for locking the contents of said counter in relation with the value indicated by said needle, in a determined position of said needle, and second means for setting the counter in a state corresponding to the value of the function to be displayed, said second means being connected to said counter and to said control circuit so that the stepping motor receives a number of driving pulses directly related to the number of clock pulses delivered by said first means to the input of said counter, in order for said needle to remain locked with said counter and that its position on the dial is representative of the contents of said counter and consequently of the value to be displayed.

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**4,314,147**

## MULTI-FUNCTION TYPE SHEET COUNTING MACHINE

**Tuyoshi Miyagawa, and Eiko Hibari, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan**

**Filed Dec. 19, 1979, Ser. No. 105,071**

**Claims priority, application Japan, Dec. 22, 1978, 53-177217[U]**

**Int. Cl.³ G06M 9/02**

**U.S. Cl. 235—92 SB** **3 Claims**

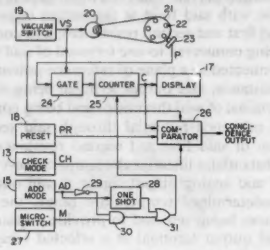
1. A multi-function type sheet counting machine comprising:

a sheet holder;

a counter for counting sheets disposed on the holder, wherein a stack of sheets disposed on the sheet holder is brought to a counting position and then counted by the counter during a counting operational mode selected from a plurality of counting operational modes, with one of the counting operational modes being an add mode; and

control means for controlling said counter such that, when one counting operation of said add mode is completed, the counter maintains the content of the counter, and such that, when one counting operation of one of said other counting operational modes is completed, the counter is caused to be reset to clear the content of the counter prior to the next counting operation, said control means comprising:

a microswitch associated with the holder for generating a first signal to reset the counter when the holder is brought to the counting position,




first means for blocking the generated first signal from being transmitted to the counter when the sheet counting machine is in said add mode, and

second means for generating a second signal to reset the counter when the sheet counting machine is changed to said add mode from one of said other counting operational modes.

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**4,314,148**

## DEVICE FOR COUNTING AND DISTRIBUTING SHEETS

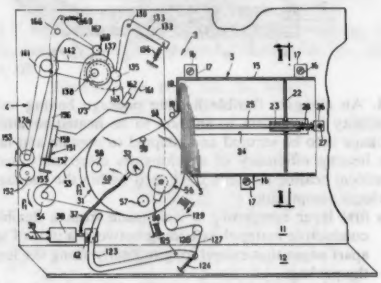
**Jacques Lallemand, Paris, France, assignor to Societe d'Etude et de Construction d'Appareils de Precision, France**

**Filed Jan. 7, 1980, Ser. No. 109,818**

**Claims priority, application France, Feb. 9, 1979, 79 03290**

**Int. Cl.³ G06M 9/02**

**U.S. Cl. 235—92 SB** **10 Claims**



1. A device for counting sheets and especially bank-bills, and comprising:

a magazine in which the sheets are placed against each other so as to form a stack;

a circular turntable rotatably mounted in proximity to said magazine about an axis parallel to the plane of the sheets within the magazine;

a sheet-extracting head rotatably mounted on said circular turntable in the vicinity of the periphery of this latter about an axis parallel to that of said turntable;

means for driving the circular turntable in rotation in a first direction;

means for driving the extracting head in rotation with respect to the turntable in the other direction;

and means for counting the number of revolutions performed by the circular turntable;

drilled holes being formed in an extracting face of said sheet-

extracting head and connectable to a vacuum source by means of ducts connected to each other and formed respectively in said extracting head, in the shaft which carries said head, in the circular turntable, and in a vacuum inlet duct formed in a stationary member which is adjacent to said turntable;

wherein the rotary circular turntable which is adapted to count one sheet per revolution also carries a plurality of columns in the vicinity of its periphery and wherein the counting device aforesaid further comprises a first safety device for producing a signal at each revolution of the turntable if and when the extracting head has taken more than one sheet, and a second safety device for checking at each revolution of the turntable whether the extracting head has in fact taken at least one sheet, said first safety device being provided with a circular sector pivotally mounted on the extracting head and having a radius equal to the distance between its geometrical axis and the cylindrical surface of the next column on the circular turntable increased by a value ranging between the thickness of a single sheet to be counted and the sum of thicknesses of two sheets, means for placing said sector in two stable angular end-positions with respect to the extracting head, namely a normal operating position and a multiple-extraction information position, means whereby the stable state of normal operation and the stable state of multiple extraction of said sector are checked at each revolution of the circular turntable, as well as means for restoring said sector to the stable position of normal operation after any transfer of said sector to the stable position of multiple-extraction information.

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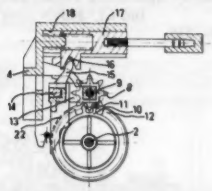
**4,314,149**

## DAILY MILEAGE RECORDING UNIT

**Michel Gomez, Joinville-le-Pont, France, assignor to e.d. Veglia, Paris, France**

**Filed Dec. 17, 1979, Ser. No. 104,432**
**Claims priority, application France, Dec. 20, 1978, 78 35750**
**Int. Cl.³ G01C *22/00***
**U.S. Cl. 235—96** **3 Claims**



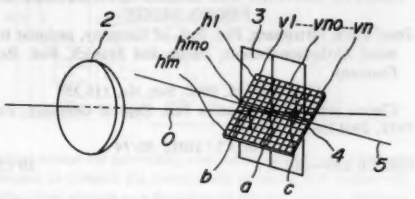
1. A daily mileage recording unit, of the type comprising a plurality of drums mounted side-by-side on the same shaft and supported in rotation by a frame, a swinging member mounted to pivot with respect to the frame, a series of gears carried by the swinging member, each disposed between two drums to displace one drum by one graduation when the preceding drum has effected a complete revolution, a sliding member guided in translation in the frame and provided with a push button, a mechanism connecting the sliding member to the swinging member to pivot the latter when the push button is displaced, a cam rotatably locked with each drum and an actuator associated with each cam and carried by the swinging member for returning to zero the corresponding drum when the push button is actuated, a square rigidly locked with each gear and ramps carried by the frame which are engaged by respective squares during the pivoting of the gears, the contact surface of the ramp being a circular sector centred on the pivoting axis.

**4,314,150**

## APPARATUS FOR DETECTING THE IN-FOCUSING CONDITIONS

**Shuichi Takayama; Yoshio Nakajima; Kosaku Tsuboshima, all of Hachioji; Teruo Iwasawa, Mitaka, and Masafumi Yamazaki, Okaya, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan**

**Filed Oct. 31, 1979, Ser. No. 90,083**
**Claims priority, application Japan, Nov. 1, 1978, 53/133761**
**Int. Cl.³ G01J *1/20***
**U.S. Cl. 250—201** **3 Claims**




1. An apparatus for detecting the in-focusing conditions comprising a light receiver arranged with an angle of inclination against an image surface of an optical system and consisting of a plurality of charge transfer elements aligned as a picture element array; means for deriving illuminance signals from the picture element array of the light receiver and means for treating the illuminance signals to detect the in-focused position of the optical system.

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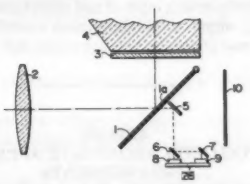
**4,314,151**

## FOCUS DETECTION BY ACCUMULATION OF A GIVEN NUMBER OF THE LARGEST ABSOLUTE DIFFERENCE MAGNITUDES BETWEEN ADJACENT PHOTOCELLS IN AN ARRAY

**Takeomi Suzuki, Tokyo, and Masahiro Aoki, Fussa, both of Japan, assignors to Olympus Optical Company Ltd., Japan**

**Filed Oct. 23, 1979, Ser. No. 87,489**
**Claims priority, application Japan, Oct. 24, 1978, 53-130620**
**Int. Cl.³ G03B *3/10***
**U.S. Cl. 250—204** **12 Claims**



1. A focus detection system comprising:

(a) focussing means for focussing an image of an object,

(b) light acceptor means including K photoelectric transducer elements juxtaposed with each other on a focus plane of the focussing means or on a plane which is optically conjugate with the focus plane, the light acceptor means producing photoelectric signals whose values vary in accordance with the distribution of light intensity of an image projected thereon by the focussing means,

(c) calculating means for calculating the value of an evaluation function which indicates the sharpness of the image based on the signals from the photoelectric transducer elements,

(d) the evaluation function being derived by initially obtaining the absolute magnitude of the difference between output signals from adjacent photoelectric transducer

elements in the light acceptor means, and accumulating N of such absolute magnitudes which are greatest in their magnitude to provide an accumulated value (where $1 \leqq N \leqq K-2$), the accumulated value representing the value of the evaluation function.

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## 4,314,152

## MONOLITHICALLY INTEGRABLE SEMICONDUCTOR CIRCUIT WITH AN AMPLIFIER CONTROLLED BY A PHOTO DIODE

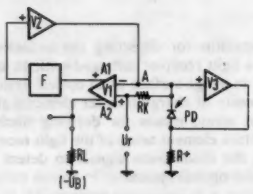
**Josef Fenk, Ottenburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Filed Jan. 25, 1980, Ser. No. 115,255**

**Claims priority, application Fed. Rep. of Germany, Feb. 5, 1979, 2904316**

**Int. Cl.³ H01J *40/14***

**U.S. Cl. 250—214 A** **10 Claims**




1. Monolithically integrable semiconductor circuit with an amplifier controlled by a photo diode, comprising a differential amplifier having inverting and noninverting inputs and outputs and a photo diode having a first and a second lead, the first lead of said photo diode being connected in the blocking direction to the inverting input of said differential amplifier, and the noninverting input of said differential amplifier being connected to a reference potential, a coupling resistor connected between the inverting and noninverting inputs of said differential amplifier, a filter circuit and a transistor amplifier being connected in a feedback branch between the noninverting output and the inverting input of said differential amplifier, and the inverting output of said differential amplifier and the second lead of said photo diode being connected to ground.

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## 4,314,153

## OPTICAL VELOCITY RESPONSIVE APPARATUS AND ARRANGEMENTS

**John M. Humphries, Hornchurch; Ivor R. Baxter, Brentwood, and David G. F. Fripp, Chelmsford, all of England, assignors to The Marconi Company Limited, Chelmsford, England**

**Filed Jan. 31, 1979, Ser. No. 8,087**

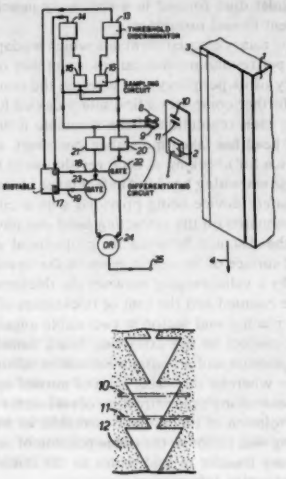
**Claims priority, application United Kingdom, Feb. 1, 1978, 3961/78**

**Int. Cl.³ G01D *5/34***

**U.S. Cl. 250—231 SE** **22 Claims**

1. In an arrangement for determining reversal of motion of a machine part, the combination of detector means and pattern means one of which is attached to the machine part and the other of which is stationary with respect thereto, for producing a sequence of electrical signal waveforms in response to movement of the machine part, each waveform being temporally asymmetrical so that the direction of movement of the machine part is uniquely defined thereby, and

means for converting said signal waveforms to an output signal which is at least predominantly of one amplitude in response to movement of the machine part in one direction and is at least predominantly of another amplitude in




response to movement of the machine part in the opposite direction.

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## 4,314,154

## TWO-DIMENSIONAL SCANNING DEVICE HAVING COMPENSATION FOR SCANNED IMAGE STRAIN

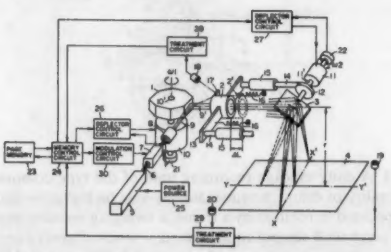
**Kazuo Minoura, Yokohama; Takehiko Kiyohara, Zama, and Haruo Uchiyama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 3, 1980, Ser. No. 109,278**

**Claims priority, application Japan, Jan. 17, 1979, 54/3034**

**Int. Cl.³ H04N *1/04***

**U.S. Cl. 250—235** **8 Claims**




1. A two-dimensional scanning device comprising:

means for providing a light beam;

first deflector means for deflecting said light beam to effect major scanning on a surface to be scanned;

second deflector means for deflecting a light beam in a direction orthogonal to the direction of deflection of the light beam by said first deflector means to effect minor scanning on said surface to be scanned in a direction orthogonal to said major scanning;

an image forming optical system disposed between said first deflector means and said second deflector means; and

mechanical means for varying the spacing between said image forming optical system and said second deflector

means in synchronism with the deflecting action of said second deflector means.

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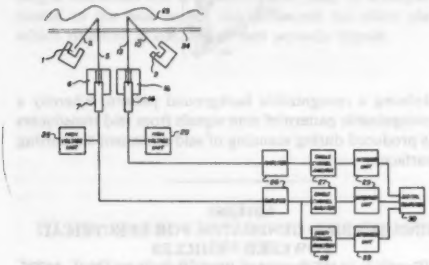
4,314,155

## METHOD AND APPARATUS FOR ELEMENTAL ANALYSIS EMPLOYING COMBINATION OF NEUTRON INELASTIC SCATTERING AND γ RAY SCATTERING

Brian D. Sowerby, Kareela, Australia, assignor to Australian Atomic Energy Commission, Coogee, Australia

Filed Jul. 19, 1979, Ser. No. 59,003
Int. Cl.³ G01V 5/00; G01N 23/00
U.S. Cl. 250—253 14 Claims



1. Measuring apparatus for quantitatively measuring the concentration of an element in a sample containing said element, said apparatus comprising a neutron inelastic scatter assembly, a γ ray scatter assembly and means to calculate said concentration from the outputs of said assemblies, said assemblies being matched to measure over essentially the same volume of said sample, said neutron inelastic scatter assembly comprising a first source yielding neutrons having energy sufficient to produce inelastically scattered first γ rays from a stable insotope of said element, a first detector to detect said first γ rays, and first shield means associated therewith to reduce the intensity of direct source, radiation, said γ ray scatter assembly comprising a second source yielding second γ rays, a second detector to detect said second γ rays scattered from said sample, and second shield means associated therewith to reduce the intensity of direct source γ rays.

8. Measuring apparatus as claimed in claim 1 adapted to measure carbon content and specific energy of coal or coke by 4.43 MeV carbon γ rays, wherein said first source yields neutrons having energy sufficient to produce inelastically scattered 4.43 MeV carbon γ rays.

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4,314,156

## AUTOMATED MASS SPECTROMETER ANALYSIS SYSTEM

Aron Kuppermann; William J. Dreyer, both of Altadena; Charles E. Giffin, Pasadena, and Heinz G. Boettger, La Canada, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 892,409, Mar. 31, 1979, abandoned, which is a continuation-in-part of Ser. No. 587,097, Jun. 16, 1975, Pat. No. 4,084,090. This application Oct. 6, 1979, Ser. No. 85,414
Int. Cl.³ B01D 59/44
U.S. Cl. 250—281 28 Claims

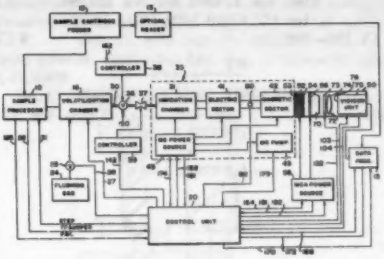
1. An analysis system comprising:

volatilization chamber means adapted to volatilize a sample supplied thereto;

mass spectrometric means to which said volatilized sample is supplied for generating therefrom an ion beam and thereafter separating said ion beam into a plurality of separate ion beams at least some of which are simultaneously focused at a substantially common focal plane;

detection means for simultaneously converting n of said focused ion beams into electrical signals where n being greater than one;

means for detecting the ion currents in m of said n ion beams, where m being less than n and equal or greater than one;



control means for providing control signals to said detection means to control the conversion of said n ion beams into electrical signals as a function of the ion current detected in said m ion beams; and

output means for receiving said electrical signals.

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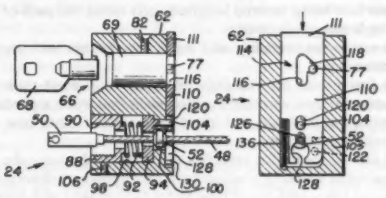
4,314,157

## SAFETY LOCK FOR RADIOGRAPHY EXPOSURE DEVICE

Thomas M. Gaines, Albany, Calif., assignor to Industrial Nuclear Company, Inc., Foster City, Calif.

Filed Jun. 21, 1979, Ser. No. 50,612
Int. Cl.³ G21F 5/02; G05G 5/06; E05B 55/02, 63/20
U.S. Cl. 250—497 10 Claims



1. A lock for securing a radiation source in a shield comprising:

a flexible member to which the radiation source is secured, which flexible member has a stop spaced from the radiation source;

means for trapping the stop, said means having a trapping and an untrapping position;

first means for biasing said trapping means to the trapping position;

means for receiving said stop having means for engaging said trapping means, said receiving and engaging means having an engaging position and a releasing position;

second means for biasing said receiving and engaging means toward the engaging position, wherein said engaging means can engage said trapping means in the untrapping position, and wherein said trapping means is urged to the trapping position by said first biasing means with the engaging means in the release position; and

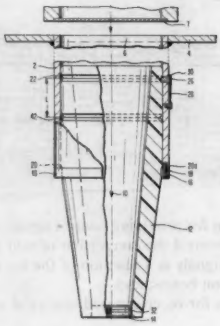
wherein said engaging means includes a pin and wherein said trapping means includes means for receiving said pin and wherein said pin is received in the pin receiving means of said trapping means to engage said trapping means in the untrapping position.

**4,314,158**

## ELECTRON APPLICATOR FOR A LINEAR ACCELERATOR

**Donald R. Lucido, Martinez, Calif., assignor to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.**

**Filed Apr. 1, 1980, Ser. No. 136,359**
**Int. Cl.³ G02B *5/00*; H01J *29/46***
**U.S. Cl. 250—505** **9 Claims**



1. An electron applicator for a linear accelerator, comprising in combination:

(a) a stationary support tube for transmitting high-energy electrons therethrough, said support tube having a first end portion for receiving said electrons and a second end portion;

(b) an insert tube for transmitting said high-energy electrons therethrough, said insert tube having a first end portion extending slideably into the second end portion of said support tube, and a second end portion for discharging said electrons, and an outer and an inner surface, said inner surface being tapered longitudinally along the path of said high-energy electrons;

(c) means for retaining said insert tube within said support tube;

(d) first means for resistibly engaging said insert tube in a selected first working position such that upon a predetermined axial force said insert tube slides farther into said support tube; and

(e) second means for resistibly engaging said insert tube in a selected working position such that upon a predetermined axial force said insert tube slides farther into said support tube, said second working position being spaced from said first working position.

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**4,314,159**

## DOCUMENT SCANNER

**James W. Davis, Richardson, Tex., assignor to The Mead Corporation, Dayton, Ohio**

**Filed May 30, 1980, Ser. No. 154,675**
**Int. Cl.³ G01N *21/30***
**U.S. Cl. 250—561** **20 Claims**

1. An image scanner for scanning a document to produce electrical scan signals representative of an image on the document along a plurality of parallel scan lines, comprising:

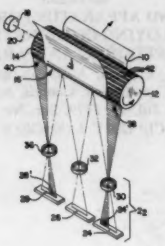
a document supporting drum, defining a document supporting surface, for receiving a document to be scanned and supporting said document on said surface,

means for rotating said drum such that said document supported thereby is transported past a document scanning station,

a plurality of photoelectric transducers, each of said transducers providing a scan signal in response to light received thereby,

optical means for directing light from each of a plurality of scan points at said scanning station to an associated one of said photoelectric transducers, whereby each of said scan points defines a scan line as said document is transported past said scanning station, and

means on said document supporting surface of said drum



defining a recognizable background pattern, whereby a recognizable pattern of scan signals from said transducers is produced during scanning of said document supporting surface.

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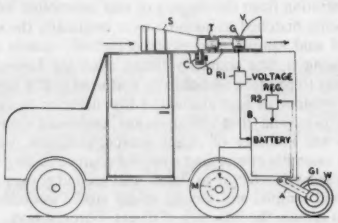
**4,314,160**

## WIND TURBINE GENERATOR FOR ELECTRICAL POWERED VEHICLES

**Leon Boodman, 1445 Brooklyn Blvd., Bay Shore, N.Y. 11706, and James P. Malone, 1 Odell Ct., Syosset, N.Y. 11791**

**Filed Apr. 25, 1980, Ser. No. 143,754**
**Int. Cl.³ B60K *1/00*; F03D *9/02***
**U.S. Cl. 290—55** **3 Claims**




1. In a vehicle having electrical battery powered means, means to provide additional electrical power comprising:

an air scoop rotatably mounted on top of the vehicle,

a wind driven turbine wheel mounted in the rear of the air scoop and,

an electric generator connected to the turbine wheel,

and means to lock the rotatable air scoop in position,

whereby air passing through the air scoop will generate additional electricity for the vehicle battery.

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**4,314,161**

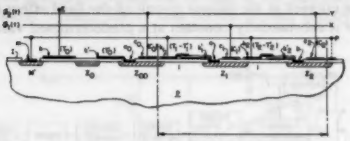
## INTEGRATED SHIFT REGISTER

**Jacob Luscher, Venthone, Switzerland, assignor to Ebauches S.A., Switzerland**

**Filed Jun. 29, 1979, Ser. No. 53,405**
**Claims priority, application France, Jul. 6, 1978, 78 20163; Jul. 6, 1978, 78 20164**
**Int. Cl.³ G11C *19/28***
**U.S. Cl. 307—221 C** **6 Claims**

1. A shift register comprising a plurality of transistors and capacitors which are integrated in a semiconductor substrate and form a plurality of cells connected one after the other, each cell comprising two identical stages connected in series and capable of being supplied by respective ones of two periodic signals in phase opposition, wherein each stage comprises an MOS transistor structure which has two principal elec-

trodes forming respectively the input and output of the stage, and two control electrodes, one of which is connected, in use, to a bias source and the other of which is connected to the



output electrode, and a capacitor, one plate of which is connected to the said output electrode and the other plate of which receives, in use, one of said periodic signals.

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**4,314,162**

## FILTER CIRCUIT UTILIZING CHARGE TRANSFER DEVICE

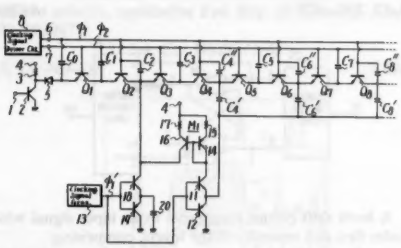
**Takao Tsuchiya, and Mitsuo Soneda, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Jan. 3, 1980, Ser. No. 109,336**

**Claims priority, application Japan, Jan. 12, 1979, 54-2782**

**Int. Cl.³ G11C** *19/28;* **H03K** *17/60, 5/00;* **H03H** *15/02*

**U.S. Cl. 307—221 D** **10 Claims**



1. A filter circuit comprising clocking signal drive means for supplying a clocking signal; clock signal generator means having an output at which a clocking control signal is provided; a transistor having first and second electrodes and a control electrode; means connecting the control electrode of said transistor to said output of said clock signal generator means; a plurality of successive capacitive storage stages for sequentially holding a charge level representing a time-sampled input signal, each of said capacitive storage stages having a clocking electrode for receiving said clocking signal so that said charge level is transferred from one to another of said capacitive storage stages in succession in response to said clocking signal, at least one of said plurality of capacitive storage stages including first and second capacitive circuit portions connected in parallel, each said first capacitive circuit portion having a clocking electrode for receiving said clocking signal and each said second capacitive circuit portion having a clocking electrode connected to the first electrode of said transistor; and current feedback means for detecting the current flowing through the second electrode of said transistor and applying a corresponding current to one of said capacitive storage stages in advance of the at least one capacitive storage stage in which said second capacitive circuit portion is included.

**4,314,163**

## INPUT STAGE FOR A CHARGE TRANSFER DEVICE (CTD) ARRANGEMENT

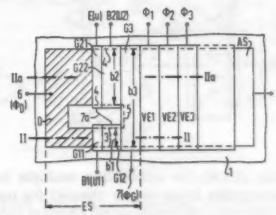
**Karl Knauer, Kirchseeon, and Hans-Joerg Pfleiderer, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Continuation of Ser. No. 63,930, Aug. 6, 1979. This application Dec. 22, 1980, Ser. No. 219,215**

**Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2838100**

**Int. Cl.³ G11C** *19/28;* **H01L** *29/78;* **H03H** *15/02*

**U.S. Cl. 307—221 D** **3 Claims**

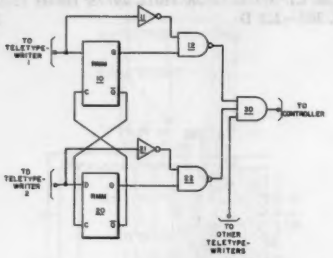


1. A charge transfer device comprising, semiconductor layer (1) of a first conductivity type, an input zone (D) of opposite conductivity type formed in said semiconductor layer, a thin insulating layer (2) covering a portion of said semiconductor layer (1), a first pair of gates (G11, G12) successively aligned on said insulating layer (2) in the channel flow direction of a first channel which is defined by longitudinally extending parallel first limited charge flow means to prevent charge transfer on opposite sides of said first channel and the transverse distance between said first limited charge flow means comprising the width of said first channel, a second pair of gates (G21, G22) successively aligned on said insulating layer (2) in the channel flow direction of a second channel which is defined by longitudinally extending parallel second limited charge flow means to prevent charge transfer on opposite sides of said second channel and the transverse distance between said second limited charge flow means comprising the width of said second channel and said width of said second channel being substantially greater than said width of said first channel, a first transfer gate (G3) mounted on said insulating layer (2) adjacent said first and second pair of gates and extending over a common channel formed by the juncture of said first and second channels and extending transversely to said common channel, an input analog signal (u) connected to the second (G12) of said first pair of gates and to the first (G21) of said second pair of gates, a first DC voltage source connected to the first (G11) of said first pair of gates, a second DC voltage source connected to the second (G22) of said second pair of gates, second and third transfer gates extending over said common channel adjacent said first transfer gate (G3) and extending transversely to said common channel and means for applying electrical signals to said input zone (D), and said first (G3), second and third transfer gates so that charges move through said first and second channels at the same time and are combined in said common channel, said first DC source having a voltage level not greater than the smallest valve of said input analog signal (u), and said second DC source having a voltage level at least as large as the maximum value of said input analog signal (u).

## 4,314,164
## COMPUTER CHANNEL ACCESS CIRCUIT FOR MULTIPLE INPUT-OUTPUT DEVICES

**Kam B. Tin, Burnaby, and Stanley R. C. Norman, Brockville, both of Canada, assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.**

**Filed Nov. 5, 1979, Ser. No. 91,422**
**Int. Cl.³ H03K *17/56*; H01R *3/00*; G11C *7/00***
**U.S. Cl. 307—243** **6 Claims**




1. An access circuit for connecting multiple input-output devices to a computer input-output channel for use in a computer system including an input-output channel and a plurality of input-output devices operated to generate data pulses, said access circuit comprising:

a plurality of monostable multivibrators each connected to an associated one of a plurality of said input-output devices, each of said monostable multivibrators further including a first output, a second output, and a reset input, said first output of each monostable multivibrator connected to said reset input of each other of said monostable multivibrators, a first one of said monostable multivibrators operated in response to a first one of said data pulses from said associated input-output device to generate a reset signal on said first output lead and an enable signal on said second output lead, each other of said monostable multivibrators operated in response to said reset signal from said first monostable multivibrator to prevent generation of an enable signal;

gating means connected to said plurality of monostable multivibrators and to said associated plurality of input-output devices, operated in response to said enable signal to gate said data pulses from said associated input-output device to said input-output channel.

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## 4,314,165
## ELECTRICAL STORAGE CIRCUIT WITH TEMPERATURE INDEPENDENT FET OUTPUT

**John Noddings, Ryton-on-Dunsmore, and Roland K. Borton, Rugby, both of England, assignors to Associated Engineering Limited, England**

**Division of Ser. No. 774,865, Mar. 7, 1977, Pat. No. 4,196,466. This application Oct. 15, 1979, Ser. No. 85,108**
**Int. Cl.³ H01L *31/00***
**U.S. Cl. 307—310** **3 Claims**

1. A storage circuit for storing an electrical signal, comprising

an electronic switch,

a capacitor connected to be charged by the electrical signal through the electronic switch,

the switch being capable of assuming a high impedance state to minimise subsequent discharge of the capacitor,

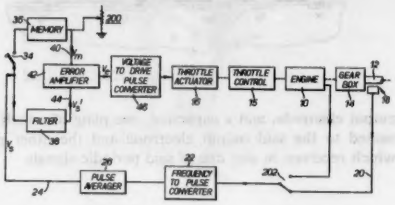
a pair of voltage supply lines,

a field effect transistor having an input circuit connected to receive the charge on the capacitor and having an output circuit,

a variable impedance device,

the output circuit of the field effect transistor being connected across the voltage supply lines in series with the variable impedance device,

means responsive to the voltage across the voltage supply lines for controlling the variable impedance device so that the current in the output circuit of the field effect transistor is substantially constant at a predetermined value, and




means connected to the output circuit of the field effect transistor to derive an output signal of the storage circuit in dependence on the charge on the capacitor,

the said predetermined value of the current being the current value at which the variation of the conductivity of the field effect transistor with temperature is substantially a minimum.

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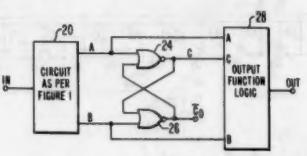
## 4,314,166
## FAST LEVEL SHIFT CIRCUITS

**Otto H. Bismarck, Fords, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Feb. 22, 1980, Ser. No. 123,714**
**Int. Cl.³ H03K *19/092, 5/01, 5/12***
**U.S. Cl. 307—475** **6 Claims**




1. A level shift circuit responsive to an input signal which includes first and second voltage levels, comprising:

means for translating said input signal to provide a first logic signal which includes said third and fourth voltage levels respectively corresponding to said first and second levels, and a complementary second logic signal which includes fourth and third voltage levels respectively corresponding to said first and second levels; and

means for providing an output signal at said third voltage level responsive to a transition of said second logic signal from said fourth to said third voltage levels, and at said fourth voltage level responsive to a transition of said first logic signal from said fourth to said third voltage levels.

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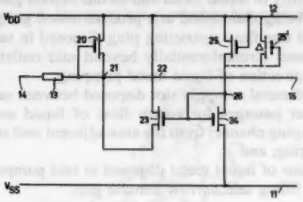
## 4,314,167
## VOLTAGE CLAMPING CIRCUIT

**Peter H. Groves, Southampton, and Robert A. Hilbourne, Chandlers Ford, both of England, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Oct. 11, 1979, Ser. No. 84,017**
**Claims priority, application United Kingdom, Oct. 20, 1978, 41406/78**
**Int. Cl.³ H03K *5/08***
**U.S. Cl. 307—540** **4 Claims**

1. A voltage clamping circuit comprising first and second supply voltage lines, an input terminal for connection to an alternating line voltage source to be clamped, an output terminal, a resistive device coupled between the input and output

terminals, a first enhancement mode MOS transistor having its drain connected to the junction of the resistive device and the output terminal, its source connected to the second supply line and its gate coupled to said junction, the first transistor being rendered conductive when the voltage at the junction rises to a threshold voltage above that of the second supply line, a



second enhancement mode MOS transistor having its source connected to said junction and its drain connected to the second supply line, and biasing means coupled to the first and second supply lines for biasing the gate of the second transistor such that the second transistor is rendered conductive as the potential at said junction approaches that applied to the first supply line.

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## 4,314,168
## PREFABRICATED STATOR WINDINGS

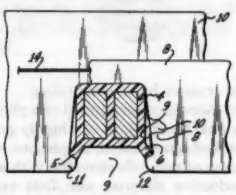
**Otto Breitenbach, Nuremberg, Fed. Rep. of Germany, assignor to Kabel-Und Metallwerke Gutehoffnungshuette A.G., Hannover, Fed. Rep. of Germany**

**Filed May 20, 1980, Ser. No. 151,658**

**Claims priority, application Fed. Rep. of Germany, May 21, 1979, 2920477**

**Int. Cl.³ H02K *41/02***

**U.S. Cl. 310—13** **6 Claims**



1. A multiphase winding for the stator of a linear motor, assembled by placing several cables in a meandering pattern in which portions of the cable are arranged in parallel and ladder rung-like fashion, the improvement of a jacket for each cable, having each two laterally extending, resiliently bendable ridges.

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## 4,314,169
## MAGNETIC MOTOR

**John Rusu, Surfside, Fla., assignor to Electro-Magnetic Motors Inc., San Juan, P.R.**

**Filed Mar. 18, 1980, Ser. No. 131,520**

**Int. Cl.³ H02K *37/00***

**U.S. Cl. 310—46** **2 Claims**

1. An electromagnetic motor comprising:

a. a fixed base,

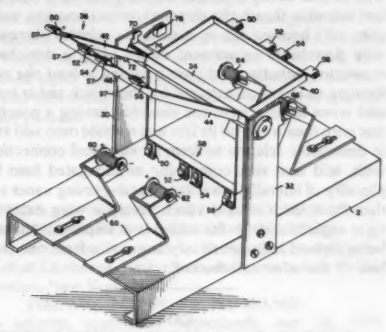
b. an elongated shaft rotatably mounted on the base,

c. a plurality of brackets mounted in spaced circumferential relation on the shaft, each bracket comprising radial arms of the same length mounted in spaced relation on the shaft, and a transverse arm mounted on the ends of the radial arms and parallel to and spaced from the shaft,

d. a pair of permanent magnets mounted on each transverse arm of each bracket in spaced relation along the transverse arm, with the magnets mounted on the brackets being circumferentially and radially aligned about the shaft,

e. a plurality of electromagnetic coils mounted on the base in surrounding relation to the shaft with the axis of each coil parallel to the shaft,

f. the permanent magnets of each pair and the electromagnetic coils being so constructed and positioned that on rotation of the shaft the permanent magnets of each pair pass in close proximity to the ends of each electromagnetic coil,



g. means normally maintaining each coil deenergized, and

h. means for so energizing each coil during passage by it of a pair of permanent magnets that each pole of each pair of permanent magnets passes adjacent a pole of the same polarity as it passes each coil.

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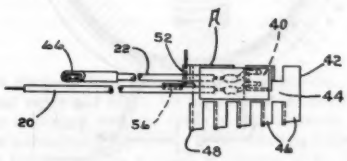
## 4,314,170
## HAND POWER TOOL CONTROL UNIT

**Edward V. Sahrbacker, Brecksville, Ohio, assignor to Lucerne Products, Inc., Northfield, Ohio**

**Filed Mar. 2, 1979, Ser. No. 16,781**

**Int. Cl.³ H02K *11/00***

**U.S. Cl. 310—68 R** **1 Claim**



1. A portable electric motor-driven tool comprising, a tool housing, an electrical motor operatively disposed in said housing, a coacting electrical control system connected to said motor and operatively disposed in the housing for controlling the speed of said motor, said electrical control system including a coacting electrical switch disposed on the housing and operatively connected to said motor for manually turning on and off the flow of electrical current to the motor to start and stop the same, said electrical control system also including a coacting thyristor and heat sink assembly, coacting electrical current conducting wires connecting said switch with said assembly, a coacting fan operatively secured to the motor providing an air stream for cooling the motor, said housing having a housing wall having a coacting cavity disposed in the air stream and configured to receive said thyristor and heat sink assembly therein, coacting assembly detachable secu-

ment means disposed in said cavity for detachably securing said thyristor and heat sink assembly within the cavity and in the air stream to cool the assembly, and coacting wire detachable securement means for detachably securing said wires to the switch, said heat sink being formed integral with the thyristor to form a unitary composite structure, said assembly detachable securement means being a detachable wire connector including said housing having a housing tab disposed on a wall of said cavity and said assembly having a coacting resilient assembly sheath clip disposed on said heat sink and slidable onto said housing tab in detachable relation therewith, said wire detachable securement means being a detachable wire connector including said switch having at least one switch tab forming an electrical terminal for the switch and at least one of said wires leading from the assembly having a coacting resilient wire sheath clip on its free end slidable onto said switch tab in detachable relation to form an electrical connection therewith, said heat sink comprising an elongated base having a plurality of laterally extending heat dispersing vanes extending therefrom, each of said vanes having a wing extending at a right angle therefrom for added heat dispersement, said vanes being formed of progressively larger size from one end of said base to the other end thereof.

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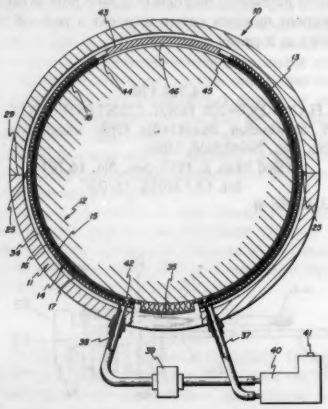
## 4,314,171
## NARROW GAP COLLECTOR WITH INTEGRAL ELECTROMAGNETIC PUMP

**Burton D. Hatch, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Feb. 29, 1980, Ser. No. 126,043**
**Int. Cl.³ H02K *13/00***
**U.S. Cl. 310—219** **10 Claims**



1. An integrally pumped current collector for an acyclic machine comprising:

a rotor collector ring having an annular rotor contact surface thereon;

a stator collector ring surrounding and disposed in juxtaposition to said rotor collector ring and having a stator ring collector surface in juxtaposition to said rotor contact surface; and said stator ring having an annular groove adjacent said stator ring collector surface;

a compliant braided metal filament brush extending circumferentially about said stator ring collector surface; said brush being disposed in said annular groove such that said brush and said stator ring collector surface define an annular liquid metal pumping channel extending about the circumference of said stator ring collector surface and including an annular groove formed in said stator ring collector surface; said brush being disposed in close radial proximity to said rotor collector surface and separated therefrom by a narrow annular gap;

an inlet passage in flow communication with said pumping channel and an outlet passage in flow communication with said pumping channel; said inlet passage and said outlet passage each being in flow communication with a liquid metal reservoir; said liquid metal reservoir containing a quantity of liquid metal and an inert cover gas; said cover gas being maintained at a predetermined gas pressure;

at least one flow restricting plug disposed in said pumping channel circumferentially beyond said outlet passage in the direction of liquid metal pumping;

a liquid metal resupply slot disposed between said inlet and outlet passages for return flow of liquid metal to said pumping channel from the area adjacent said stator collector ring; and

a volume of liquid metal disposed in said pumping channel, and filling said narrow annular gap.

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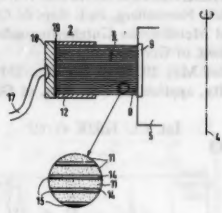
## 4,314,172
## CURRENT TRANSFER BRUSH

**Heinrich Diepers, Höchstadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Mar. 14, 1979, Ser. No. 20,402**
**Claims priority, application Fed. Rep. of Germany, Apr. 20, 1978, 2817371**
**Int. Cl.³ H02K *13/00***
**U.S. Cl. 310—248** **15 Claims**



1. A current transfer brush comprising:

(a) a flexible slider member formed of a plurality of separate and individual flexible foils of a highly graphitized graphite in a stacked arrangement, at least one of the flat sides of at least some of said foils provided with a layer of electrically conductive material, said foils extending at least approximately perpendicular to the contact surface of the brush; and

(b) current supply means to which one end of each of said individual flexible foils facing away from the contact surface of the brush is bonded, said current supply means containing a frame element at said end, said frame element holding together said individual flexible foils, said bonding and said holding existing only at said one end.

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## 4,314,173
## MOUNTING BRACKET FOR BRACING PERIPHERAL CONNECTING RINGS FOR DYNAMOELECTRIC MACHINES' STATOR WINDINGS

**Rudolph R. Srdoch, Trafford, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Apr. 10, 1980, Ser. No. 139,078**
**Int. Cl.³ H02K *3/46***
**U.S. Cl. 310—260** **4 Claims**

1. A dynamoelectric machine comprising:

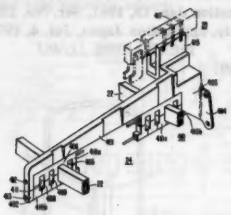
a generally tubular-shaped stator core structure having slots along the inner periphery thereof;

a stator winding having a plurality of coil sides disposed in said stator core slots and a plurality of connector ring segments disposed in the stator core's end regions for

electrically connecting said coil sides; 'a plurality of mounting brackets disposed at both ends of said stator core at selected circumferential positions for bracing said connector ring segments, each of said mounting brackets comprising;

(a) a foundation structure attached to and cantilevered from said stator core structure;

(b) a plurality of spacers disposable about said connector ring segments for restraining relative movement of said



connector ring segments and for maintaining selected separations therebetween; and

(c) means for securing said spacers to said foundation structure for restraining relative movement therebetween; and

wherein said foundation structure comprises;

(a) a base portion extending generally axially from said stator core structure; and

(b) a spacer retaining leg portion disposed perpendicularly to said base portion at each end thereof.

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**4,314,174**

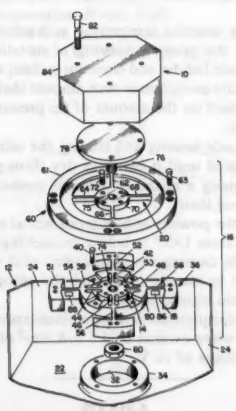
## PIEZOELECTRIC TRANSDUCER DRIVE HAVING TEMPERATURE COMPENSATION

**Thomas Wing, and Lloyd M. Germain, both of Woodland Hills, Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.**

**Filed Mar. 25, 1980, Ser. No. 133,730**

**Int. Cl.³ H01L *41/08;* G01B *9/02***

**U.S. Cl. 310—315** **9 Claims**



1. A temperature compensated piezoelectric transducer drive, comprising:

a flexure element connected between a fixed mass and a mass to be driven,

a piezoelectric element attached to said flexure element,

a resistive element attached to said flexure element,

a temperature responsive element juxtaposed to said piezoelectric element and said resistive element,

a power amplifier having an output for impressing a voltage across said piezoelectric element thereby causing the movement of said piezoelectric element and, in turn, the movement of said flexure element,

said resistive element moving with said movement of said flexure element thereby undergoing a change of resistance,

said resistive element and said temperature responsive element connected in a feedback loop about said power supply for generating a feedback signal,

reference means for establishing a reference signal; and

circuit means within said feedback loop for characterizing said output of said power amplifier by comparing said feedback signal against said reference signal for controlling said movement of said piezoelectric element and said flexure element.

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**4,314,175**

## METHOD VAPOR DISCHARGE LAMP HAVING SPECIFIC RANGE OF XENON PRESSURES

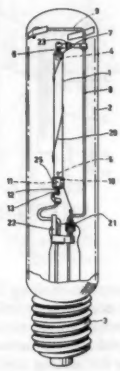
**Cornelis A. J. Jacobs; Johannes A. T. Schellen, and Gijsbert Kuus, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Mar. 24, 1980, Ser. No. 132,945**

**Claims priority, application Netherlands, Apr. 26, 1979, 7903285**

**Int. Cl.³ H01J *61/26***

**U.S. Cl. 313—174** **6 Claims**



1. A discharge lamp comprising a discharge vessel in which a metal vapor and xenon are present and an absorbing substance in contact with the xenon in such a manner that the xenon is absorbed at least partly in the absorbing substance and when the temperature is raised is released partly from said substance and at 300K the xenon pressure P is smaller than 100 kPa and in the operating condition of the lamp P is larger than 100 kPa, characterized in that the absorbing substance and the xenon are dosed so that, at 300K, P has a value in the range 1 kPa to 25 kPa.

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**4,314,176**

## HALOGEN INCANDESCENT LAMP

**Victor R. Notelteirs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Sep. 4, 1979, Ser. No. 71,802**

**Claims priority, application Netherlands, Sep. 13, 1978, 7809301**

**Int. Cl.³ H01K *1/50***

**U.S. Cl. 313—185** **1 Claim**

1. A line voltage halogen incandescent lamp having a tubu-

lar lamp envelope and a filament stretched axially therein, the lamp envelope filling comprising an inert gas and hydrogen

bromide, characterized in that the pressure of the gas mixture during operation of the lamp is between 0.8 and 1 bar.

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**4,314,177**

**LOW-ENERGY-ELECTRON-EXCITING FLUORESCENT DISPLAY DEVICE**

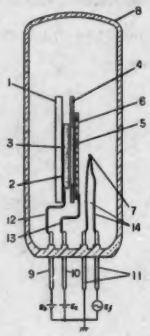
**Tomizo Matsuoka, Neyagawa; Tsuneharu Nitta, Katano, and Shigeru Hayakawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan**

**Continuation of Ser. No. 55,194, Jul. 2, 1979, abandoned. This application Jan. 15, 1981, Ser. No. 225,322**

**Claims priority, application Japan, Jul. 7, 1978, 53-83369**

**Int. Cl.³ C09K *11/465***

**U.S. Cl. 313—497** **1 Claim**



1. A low-energy-electron-exciting fluorescent display device comprising an anode coated with $SnO_2$:Eu powder phosphor, a cathode as a thermoelectronic emission source confronting said anode, a mesh grid located between said anode and cathode, and a glass tube for sealing said components in vacuum, wherein the Eu content in said phosphor is such that the quantity of Eu based on the amount of Sn present is $5\times10^{-2}$ to 10 atomic % and the phosphor is prepared by the steps comprising:

(a) preparing an aqueous solution of europium and at least one material selected from the group consisting of stannous halides and stannous sulfate, the ratio of the europium ions based on the amount of tin ions present being between $5\times10^{-2}$ and 10 atomic %;

(b) pouring said solution into an aqueous solution comprising oxalic ions which is kept at a temperature between 40° and 100° C., while stirring the resultant mixed solution, thereby forming a single crystalline oxalate coprecipitate of tin and europium, the pouring rate being lower than the rate whereby the formed oxalate coprecipitate assumes rod-like polycrystalline particles having a dendrite-like configuration with numerous pores;

(c) thermally decomposing said coprecipitate at a temperature between 400° and 1000° C. to a product comprising stannic oxide; and

(d) subjecting said decomposed material to heat treatment at a temperature of from 1300° C. to below the melting temperature of stannic oxide, causing the europium ions to be diffused into the stannic oxide;

whereby the phosphor exhibits a luminescence intensity of more than 25 f·L when excited by 1.5 mA/cm² of electrons with an anode voltage of 10 V.

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**4,314,178**

**LOW-ENERGY-ELECTRON-EXCITING FLUORESCENT DISPLAY DEVICE**

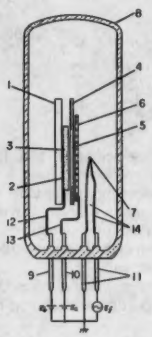
**Tomizo Matsuoka, Neyagawa; Tsuneharu Nitta, Katano, and Shigeru Hayakawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan**

**Continuation of Ser. No. 55,193, Jul. 2, 1979, abandoned. This application Jan. 15, 1981, Ser. No. 225,323**

**Claims priority, application Japan, Jul. 4, 1978, 53-81810**

**Int. Cl.³ C09K *11/465***

**U.S. Cl. 313—497** **1 Claim**



1. A low-energy-electron-exciting fluorescent display device comprising an anode coated with $SnO_2$:Eu powder phosphor, a cathode as a thermoelectronic emission source confronting said anode, a mesh grid located between said anode and cathode, and a glass tube for sealing said components in vacuum, wherein Eu content in said phosphor is such that the quantity of Eu based on the amount of Sn present is $5\times10^{-2}$ to 10 atomic % and the phosphor is prepared by the steps comprising:

(a) admixing a material comprising at least one member selected from the group consisting of metallic tin, stannous halides, stannic halides and stannous sulfate; with an additive which includes europium in such amount that the quantity of europium based on the amount of tin present is $5\times10^{-2}$ to 10 atomic %;

(b) simultaneously heating and stirring the mixture of step (a) with nitric acid until it becomes dry through evaporation, thereby forming a mixed powder of metastannic acid and europium; and then

(c) subjecting the powder to heat treatment at a temperature in the range of from 1300° to below the melting temperature of stannic oxide, causing the metastannic acid to be thermally decomposed to stannic oxide and the europium to be diffused into said stannic oxide,

whereby the phosphor exhibits a luminescence intensity more than 25 f.L when excited by 1.5 mA/cm² of electrons with an anode voltage of 10 V.

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**4,314,179**

**HORIZONTAL SCANNING RATE CORRECTION APPARATUS**

**Akira Tooyama, and Takashi Hosono, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Mar. 31, 1980, Ser. No. 135,667**

**Claims priority, application Japan, Apr. 3, 1979, 54-40138**

**Int. Cl.³ H01J *29/41***

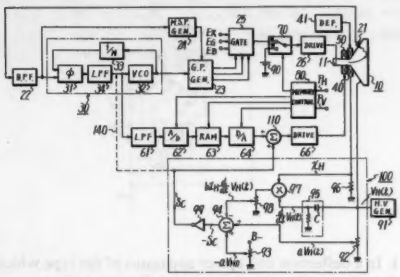
**U.S. Cl. 315—12 ND** **12 Claims**

1. Horizontal scanning rate correction apparatus for a cath-

ode-ray tube having a screen, means for projecting an electron beam upon said screen, an anode supplied with a high voltage from a high voltage source, and a beam deflection device supplied with at least horizontal and vertical beam deflection signals for causing said beam to repeatedly scan across said screen in a vertical succession of horizontal lines, said apparatus comprising:

memory means for storing a plurality of correction values representing deviations of the horizontal scanning rate of said electron beam from a desired scanning rate;

reading means for reading said plurality of stored correction values from said memory means;



correcting signal forming means for sensing fluctuation in the value of said high voltage from the high voltage source and for producing a correcting signal in response thereto; and

scanning rate modulating means supplied with the plurality of correction values read by said reading means and supplied with the correcting signal from said correcting signal forming means for substantially cancelling any deviations in the horizontal scanning rate from said desired scanning rate.

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**4,314,180**

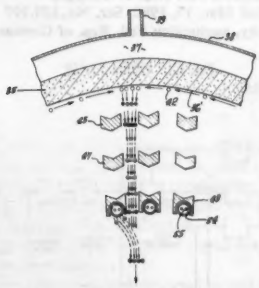
## HIGH DENSITY ION SOURCE

**Winfield W. Salisbury, Scottsdale, Ariz., assignor to Occidental Research Corporation, Irvine, Calif.**

**Filed Oct. 16, 1979, Ser. No. 85,393**

**Int. Cl.³ H01J** *7/24, 27/00*

**U.S. Cl. 376—130** **17 Claims**



1. A source for a high density electrically substantially neutral beam of combined positive and negative particles, including in combination:

a housing

a substrate mounted in said housing and having a first generally spherical surface;

first means for producing free elements at said first surface;

second means for directing a beam of electrons along said surface for ionizing said free elements producing positive ions;

a first positive ion extractor grid mounted in said housing spaced from said first surface;

a second positive ion accelerator grid mounted in said housing spaced from said first grid;

electron emitter means mounted in said housing for producing the negative particles; and

a third electron accelerator grid mounted in said housing between said second grid and said electron emitter means;

with said second means including:

an elongate electron gun positioned along an edge of said first surface of said substrate for emitting electrons in a first direction; and

magnet means positioned along an adjacent edge of said surface providing a magnetic field in a second direction transverse to said first direction for curving the path of said electrons along said first surface.

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**4,314,181**

## ARC DISCHARGE LAMP STARTING DEVICE

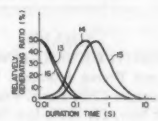
**Kenichi Kawasumi, 7-4-2, Kabemachi, Ohme-shi, Tokyo, and Kenji Narikiyo, 2196-560, Hirai, Hinodemachi, Nishitamagun, Tokyo, both of Japan**

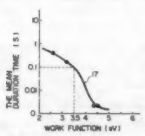
**Filed May 23, 1980, Ser. No. 152,541**

**Claims priority, application Japan, Jun. 18, 1979, 54-75717**

**Int. Cl.³ H05B** *41/18;* **H01J** *61/56*

**U.S. Cl. 315—289** **3 Claims**




1. An arc discharge lamp starting device for connecting an arc discharge lamp to a power source through an inductive ballast, which comprises a starting aid circuit including, connected in series, a thermal switch having contact rods which are closed at room temperature and opened at a high temperature, a heater for controlling opening and closing of the thermal switch and a resistor for controlling an electric current flowing in the heater, said starting aid circuit being connected in parallel to an arc tube, wherein said contact rods of the thermal switch are composed of a high-melting-point metal material having a work function not exceeding 3.5 eV.

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**4,314,182**

## SYSTEM FOR CONTROLLING THE POWER OF A HIGH-VOLTAGE ELECTRON BEAM GENERATOR

**Friedrich W. Thomas; Wolfgang Sperzel, and Jürgen Petzoldt, all of Geinhausen, Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany**

**Filed May 27, 1980, Ser. No. 153,516**

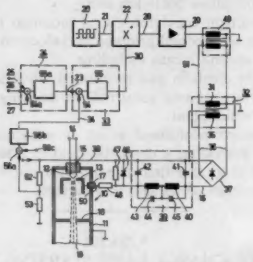
**Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928301**

**Int. Cl.³ H05B** *7/02;* **H01J** *37/30*

**U.S. Cl. 315—307** **2 Claims**

1. In a system for the control of power of a high-voltage electron beam generator having a cathode and a control electrode for the cathode, of the type having a controller at ground potential, a pulse generator for the production of square-wave

voltage pulses symmetrical with ground potential, a transformer for transferring high-voltage potential to the beam generator including a primary winding substantially at ground potential and a secondary winding at high-voltage potential, a full-wave rectifier connected to the secondary winding and a filter connecting the rectifier to the cathode and to the control



electrode, the improvement wherein the filter comprises: an LC combination of at least two LC members connected in series, in conjunction with at least two capacitors, one parallel to the cathode-control electrode and the other parallel to the full-wave rectifier, the resonance frequencies of the LC members being in a ratio of approximately 2:1.

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**4,314,183**

**SAWTOOTH-GENERATING CIRCUIT**

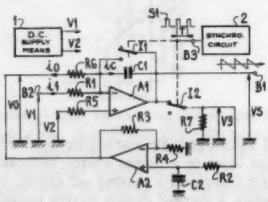
**Philippe Heuze, and Pierre Lambert, both of Paris, France, assignors to Thomson-CSF, Paris, France**

**Filed Nov. 13, 1979, Ser. No. 93,495**

**Claims priority, application France, Nov. 14, 1978, 78 32107**

**Int. Cl.³ H01J *29/70, 29/72***

**U.S. Cl. 315—389** **6 Claims**



1. A circuit for generating sawtooth signals, particularly for cathode-ray scanning of the line-by-line type and comprising:

an operational amplifier having a non-inverting input, an inverting input and an output for delivering said sawtooth signal;

a capacitor connected between said output and said inverting input;

direct-current supply means for producing a first constant positive voltage applied to said inverting input through a first resistor, and a second constant positive voltage of lower value than the first voltage and which is applied to the non-inverting input of the amplifier;

a first switching circuit connected to the terminals of the capacitor and caused to close periodically by a pulse train produced by an auxiliary pulse-generating circuit;

a control loop circuit connected between the output and the inverting input of the amplifier the connection to the inverting input being made through a second resistor, the loop circuit comprising a second switching circuit in series with a low-pass filter circuit whose cut-off frequency is selected to pass the D.C. component so as to produce a voltage corresponding to the mean value of the sawtooth signal, said second switching circuit being controlled by said pulse-generating circuit in opposite phase with respect to the first switching circuit.

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**4,314,184**

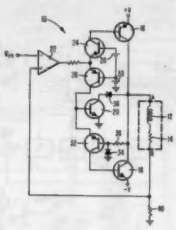
**DEFLECTION COIL DRIVER APPARATUS**

**John O. Ryan, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.**

**Filed Mar. 4, 1980, Ser. No. 127,163**

**Int. Cl.³ H01J *29/70***

**U.S. Cl. 315—408** **9 Claims**



1. In a deflection coil driver apparatus of the type which has a class B amplifier for driving a deflection coil via one of a plurality of power transistors, the improvement comprising:

transistor switch means coupled to sense the voltage on the deflection coil and for turning on one of said power transistors when the sensed voltage is negative such that said coil is coupled to a negative voltage source for generating a negative current of negative slope, and for turning on another of said power transistors when the sensed voltage is positive such that said coil is coupled directly to ground rather than to a negative voltage source to generate a negative current of positive slope; and

said deflection coil being coupled to a positive voltage source via still another power transistor to generate in the coil a positive current of positive slope.

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**4,314,185**

**CONTROL CIRCUIT FOR AN AUTOMATED PRESS SYSTEM**

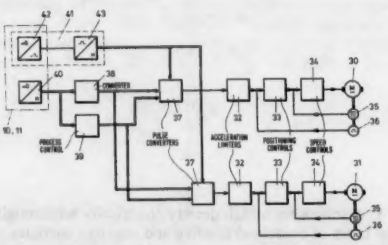
**Franz Schneider, Göppingen, and Burkhard Schumann, Ottenbach, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Ottenbach, Fed. Rep. of Germany**

**Filed Mar. 17, 1980, Ser. No. 131,197**

**Claims priority, application Fed. Rep. of Germany, Mar. 16, 1979, 2910399**

**Int. Cl.³ G05B *11/18***

**U.S. Cl. 318—85** **9 Claims**



1. A circuit arrangement for an automated press system having a press ram and a press automation system in which a pulse generator coupled to the press enables positioning control circuits via an evaluation circuit in dependence on the

speed of operation of the press, said positioning control circuits driving actuators of the press automation system and the automation system following a predetermined operating charcteristic by moving up to programmable set points, the pulse generator produces directly-coded actuating signals indicative of the position of the press ram, that the evaluation circuit includes a converter in parallel with a process control circuit, the inputs of said converter and process control circuit coupled to the pulse generator output and the outputs of said converter and process control circuit being connected to one or more pulse converters for said actuators, that the pulse converters are fed with control pulses from a generator which detects the number of strokes executed by the press, and that the outputs of the pulse converters are connected to said positioning control circuits for driving said actuators.

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**4,314,186**

## WIPER MOTOR CIRCUIT ARRANGEMENT

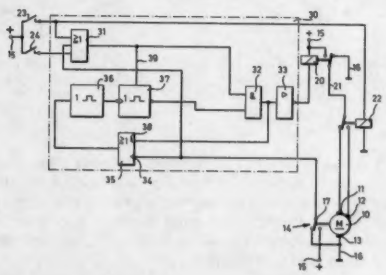
**Gunther Gille, Sersheim; Horst Goertler, Sachsenheim; Hans Prohaska, and Horst Rachner, both of Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.**

**Filed Dec. 6, 1979, Ser. No. 100,948**

**Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852676**

**Int. Cl.³ H02K *23/68***

**U.S. Cl. 318—434** **2 Claims**



**1.** A control circuit for operating the motor of a windshield wiper from a parking position and through a given angular swing, said circuit comprising, in combination:

first means for producing a first signal during a portion of each wiping cycle of said motor;

means for generating a reference signal having a predetermined time duration;

means for comparing said first signal to said reference signal for providing an output signal when the duration between successive ones of said first signal exceeds the duration of said reference signal;

switch means responsive to said output signal for removing operating potential from said motor; and,

means connected between the comparing means and said switch means and responsive to said first signal for applying said output signal to said switch means only when said wiper is in said parking position.

**4,314,187**

## DIGITAL CONTROL SYSTEM FOR AUTOMATIC-FOCUS CAMERAS

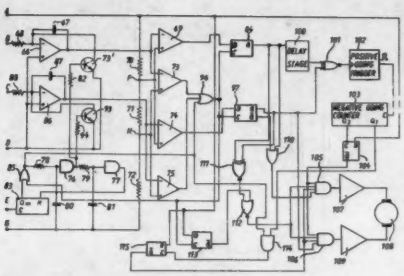
**Istvan Cocron, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jul. 3, 1980, Ser. No. 166,093**

**Claims priority, application Fed. Rep. of Germany, Jul. 12, 1979, 2928142**

**Int. Cl.³ G05B *5/01***

**U.S. Cl. 318—611** **8 Claims**



**1.** A clocked control circuit for driving a bidirectional servo such as an electric motor in accordance with congruence and non-congruence between first and second digital input signals, comprising:

a clocked discriminator circuit monitoring the first and second digital input signals and establishing congruence and non-congruence therebetween;

a servo drive connected to the discriminator circuit and the servo and operating in a manner that when non-congruence between the first and second digital input signals is established, the servo can be driven in such a direction as will tend to establish congruence between them;

a transition monitor monitoring the first and second digital input signals and generating a transition signal whenever the first and second digital input signals are initially in a non-congruent state and are subsequently in a different state;

a counter counting all transition signals as such transition signals are generated; and

a drive override circuit connected to the counter and to the servo drive, the drive override circuit operating in a manner that when a predetermined number of transition signals have been counted by the counter, the servo drive is overriden to de-energize the servo until a clock pulse is received and the counter is reset.

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**4,314,188**

## STABLE SUBSYNCHRONOUS DRIVE SYSTEM FOR GYROSCOPE ROTOR

**Henry K. Voigt, North Merrick, N.Y., assignor to Sperry Corporation, New York, N.Y.**

**Filed Mar. 15, 1979, Ser. No. 20,579**

**Int. Cl.³ H02P *5/28*; G05B *5/01***

**U.S. Cl. 318—721** **6 Claims**

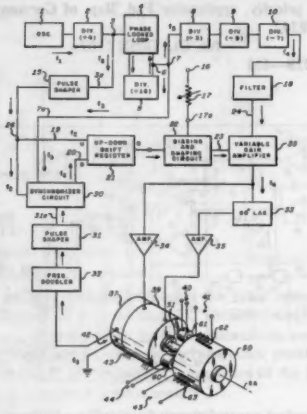
**1.** An improved gyroscope of the type having a rotor coupled to a synchronous motor which has randomly synnchronizing permanent magnetic poles, wherein the improvement comprises:

means for generating an excitation drive signal for said synchronous motor having a constant stable frequency and a variable amplitude;

means for generating a speed signal proportional to the frequency of rotation of said gyroscope rotor coupled to said synchronous motor;

means for comparing the phase of the speed signal to the phase of the excitation drive signal and providing an output signal proportional to the difference thereof; and

means for varying the amplitude of the excitation drive signal responsive to the output signal of said phase comparator means, such that the excitation drive signal ap-



plied to said synchronous motor maintains the frequency of rotation of said synchronous motor at a constant subsynchronous frequency slower than the constant stable frequency of the excitation drive signal;

whereby the rotation of said synchronous motor at the constant subsynchronous frequency causes the permanent magnetic poles of said synchronous motor to rotate.

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**4,314,189**

**DEVICE FOR CONTROLLING THE COMMUTATING ANGLE OF AN INVERTER DEVICE**

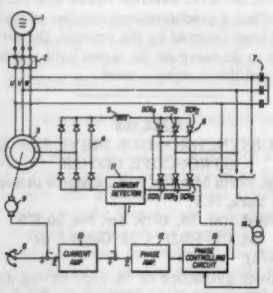
**Chihiro Okado, Fuchu; Takashi Morishita, Tokyo, and Koki Hasegawa, Hino, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Dec. 5, 1979, Ser. No. 100,561**

**Claims priority, application Japan, Feb. 21, 1979, 54-19472**

**Int. Cl.[3] H02P 1/26**

**U.S. Cl. 318—732** **7 Claims**



1. A separate excitation type inverter device including an A.C. bridge circuit in which an A.C. power source is used as a commutating source, wherein D.C. power is returned to the A.C. power source by an inverter bridge circuit, said device comprising:

means for converting the A.C. power source into six phase components;

a control circuit for controlling the commutating angle of the inverter bridge circuit by combining selected of said phase components to produce control signals based on selected combinations of said phase components, wherein said control signals are used for controlling the inverter bridge circuit commutating angle;

first means for setting a first predetermined level of voltage;

second means for setting a second predetermined level of voltage;

first means for comparing the output of said converting means with the output of said first voltage setting means;

second means for comparing the output of said converting means with the output of said second voltage setting means;

means for adding the outputs of said first and second comparing means; and

means for combining the output of the adding means with the control signals produced by the combination of said phase components such that the commutating angle of said inverter device is also controlled in response to the output of said adding means.

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**4,314,190**

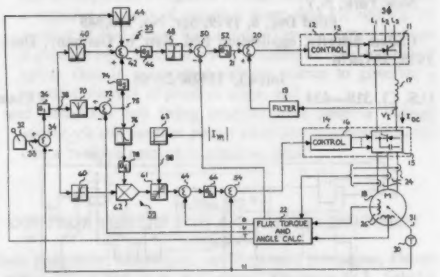
**CONTROLLED CURRENT INVERTER WITH ANGLE COMMAND LIMIT**

**Loren H. Walker, Salem, and John H. Cutler, Roanoke, both of Va., assignors to General Electric Company, Salem, Va.**

**Filed Apr. 22, 1980, Ser. No. 142,657**

**Int. Cl.[3] H02P 5/40, 7/42**

**U.S. Cl. 318—798** **24 Claims**



1. A control for an AC electric motor having a stator and a rotor spaced from the stator by a gap across which gap flux is produced in response to an electrical motor current of variable magnitude and frequency through windings associated with said stator, said control serving to control the electrical torque of said motor and comprising:

(a) means to determine, with respect to the motor, the instantaneous electrical torque, the instantaneous motor current, and the instantaneous angle between the gap flux and the motor current and to provide signals proportional thereto;

(b) means to establish a torque reference signal proportional to a desired level of electrical torque;

(c) means responsive to said torque reference signal to generate a current error signal, said current error signal acting as the primary control parameter serving to vary the magnitude of the motor current;

(d) means responsive substantially solely to said torque reference signal to derive an angle reference signal representative of the desired angle between the gap flux and the motor current;

(e) means to compare said angle reference signal with said signal proportional to the instantaneous angle between the gap flux and motor current and to generate an angle error signal representative of any difference therebetween and effective to vary the frequency of the motor current and

accordingly the angle between the gap flux and the motor current; and

(f) means responsive to said instantaneous motor current to limit said angle reference signal to predetermined values as a function of motor current in the region of relatively low valued motor currents in relation to the motor's rated current value.

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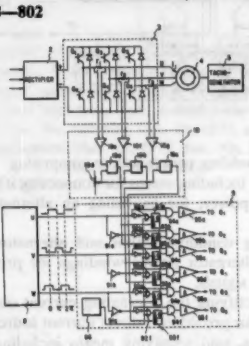
**4,314,191**

## PROTECTIVE SYSTEM FOR INVERTER CIRCUIT USED IN DRIVING AC MOTORS

**Shigeki Kawada, 346-15, Oaza-Shimoda, Hino-shi, Tokyo 191, and Hiroshi Ishida, 2-73, Matsubara-cho, 2-chome, Hamura-machi, Nishitama-gun, Tokyo 190-11, both of Japan**

**Filed Oct. 31, 1979, Ser. No. 89,741**
**Int. Cl.³ H02P *5/28***
**U.S. Cl. 318—802** **5 Claims**



1. In a speed control system which includes an inverter circuit for converting a direct current into a polyphase alternating current in the form of a rectangular wave by the switching action of transistors, and an inverter drive circuit for regulating the output frequency of the inverter circuit to a prescribed value, an AC motor being energized by the alternating current supplied thereto by the inverter circuit, an improved protective system for the inverter circuit, comprising:

overcurrent detection means for detecting the current that flows through the output side of the inverter circuit;

means for interrupting the operation of the inverter drive circuit in response to a signal from said overcurrent detection means when said overcurrent detection means detects an overcurrent;

means for restoring the operation of the inverter drive circuit for fixed periods;

the operation of the inverter circuit being interrupted when the current flowing through the transistors thereof is caused when an overload in the AC motor reaches a predetermined value, and restored after the lapse of a fixed period of time; and

the means for restoring the operation of the inverter drive circuit for fixed periods comprises a flip-flop circuit and a pulse generator, the inverter drive circuit when in the interrupted state being restored to the operative state by an output signal from said flip-flop circuit which is set by a pulse generated by said pulse generator.

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**4,314,192**

## ELECTRICAL POWER GENERATION APPARATUS AND METHOD UTILIZING ELECTRON BEAM DISCHARGE

**Charles R. Caro, Florence, S.C., assignor to CWM Corporation, Spruce Pine, N.C.**

**Filed Nov. 1, 1979, Ser. No. 90,132**
**Int. Cl.³ H01J *23/34*; H02N *11/00***
**U.S. Cl. 322—2 R** **22 Claims**

1. Electrodynamic apparatus comprising electron beam discharge means for directing electron beams and including a plurality of deflection, emission and target electrodes defining a parallel array of elongate electron beam channels each occluded at one end by an emission electrode and at the opposite end by a target electrode; magnetic field generating means for imposing on said array a magnetic field having flux lines directed perpendicularly to the longitudinal axes of said channels; and control circuit means electrically connected with said electron beam discharge means for applying thereto voltages effective to sequentially discharge electron beams through a succession of said channels while directing successive beams

through channels spaced one from another within said magnetic field in a direction generally perpendicular to both said axes and said magnetic flux lines.

22. A method of operating an electrodynamic apparatus comprising the steps of discharging an electron beam through an elongate electron beam channel, while imposing on the channel a magnetic field having flux lines directed perpendicularly to the longitudinal axis of the channel, and while effecting relative movement between the electron beam within the magnetic field and the magnetic flux lines in a direction generally perpendicular to both the axis of the channel and the magnetic flux lines.

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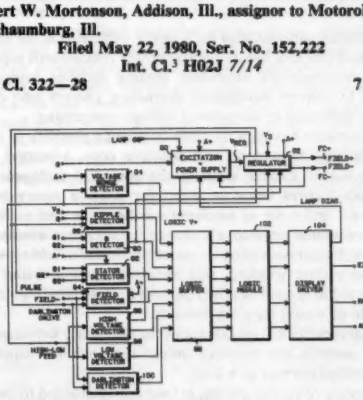
**4,314,193**

## FIELD COIL FAULT DETECTOR FOR AUTOMOTIVE ALTERNATOR BATTERY CHARGING SYSTEMS

**Robert W. Mortonson, Addison, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed May 22, 1980, Ser. No. 152,222**
**Int. Cl.³ H02J *7/14***
**U.S. Cl. 322—28** **7 Claims**



1. In a multiphase alternator and voltage regulator battery charging system, said alternator having a field coil and diode connected in a parallel circuit, said voltage regulator supplying excitation current to said field coil in response to a detected system voltage, a detector monitoring the operational status of said field coil circuit comprising:

means monitoring a first signal at a first terminal of said field coil circuit;

means generating sampling intervals on a repetitive basis;

means coupled to said voltage regulator and responsive to said sampling means, for interrupting said excitation signal supplied by said voltage regulator to said field coil circuit during sampling intervals;

means coupled to a second terminal of said field coil circuit and operative only during said sampling intervals to measure a second signal in said circuit; and

comparator means comparing said first and second signals producing an output signal when said comparison varies from a predetermined value.

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## 4,314,194
## ALTERNATOR-RECTIFIER UNIT WITH HIGHER VOLTAGE EXCITATION CIRCUIT

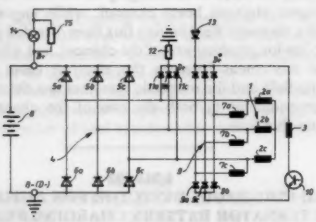
**Joachim Severing, Ludwigsburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed May 6, 1980, Ser. No. 147,177**

**Claims priority, application Fed. Rep. of Germany, May 18, 1979, 2920101**

**Int. Cl.³ H02J 7/14; H02P 9/30**

**U.S. Cl. 322—89** **2 Claims**



1. An alternator-rectifier for a motor vehicle or other mobile or isolated unit that has its electric power requiements supplied by an engine-driven alternator feeding rectifier bridge arranged to convert multiphase alternating current into direct current delivered at a regulated voltage comprising:

an alternator having a multiple core and a plurality of phase windings wound on said multiple core, a second core having an exciter winding thereon, said multipole and second cores being arranged for relative rotary movement, and a set of auxiliary windings on said multipole core wound respectively alongside said phase windings so as to be intersected by the same portion of a field set up by said exciter winding, said auxiliary winding being connected in series with the respective phase windings alongside of which they are wound;

a main rectifier bridge connected to said phase windings and to positive and negative output terminals for supplying rectified current to a load;

a plurality of exciter diodes, at least one connected to each of said auxiliary windings, for supplying rectified current at a voltage greater than the voltage across said load to a circuit comprising said exciter winding and voltage regulator for regulating the voltages across said load by control of the current passing through said exciter winding, and

another set of diodes connected to said phase windings, one to each phase winding, and also together, for providing an independently rectified low-voltage supply of current for said voltage regulator.

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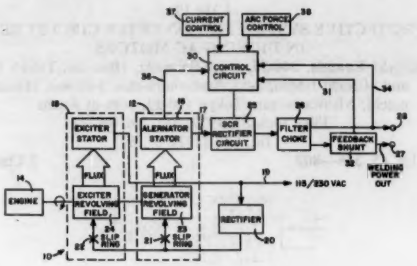
## 4,314,195
## SOLID STATE CONTROL FOR MOTOR-GENERATOR WELDER

**Bryce A. Muter, Troy, Ohio, assignor to Hobart Brothers Company, Troy, Ohio**

**Filed Nov. 1, 1979, Ser. No. 90,377**

**Int. Cl.³ H02M 7/155; H02P 9/30, 13/16**

**U.S. Cl. 322—90** **2 Claims**




1. A rotary welding power source comprising

an alternator, including means for connecting it to a rotating source of power, for providing an alternating current output,

synchronizing windings within said alternator associated with the alternator power windings for providing synchronizing signals,

means for rectifying the alternating current output of said alternator for providing a direct current source of current for welding, said rectifying means including gate controlled thyristors,

control circuit means sensing the condition of the direct current output of said rectifying means as compared to a reference and responsive to said synchronizing signals for controlling the time of conduction of said gate controlled thyristors

and means connected between said synchronizing windings and said control circuit means for providing a source of control signals unaffected by the operation of said gate controlled thyristors.

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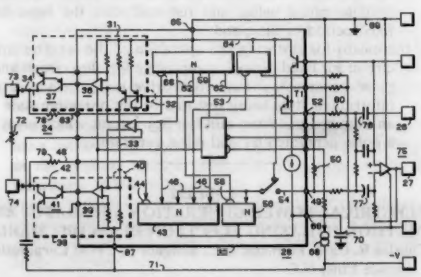
## 4,314,196
## CURRENT LIMITING CIRCUIT

**Leland T. Brown, Phoenix, Ariz., assignor to Motorola Inc., Schaumburg, Ill.**

**Filed Jul. 14, 1980, Ser. No. 167,852**

**Int. Cl.³ G05F 3/20**

**U.S. Cl. 323—315** **17 Claims**



1. Current limiting apparatus comprising:

a load having one side thereof coupled to one terminal of a

power source and the other side thereof coupled to another terminal of said power source,

a first and a second current path located between one side of said load and the associated terminal of said power source,

current mirror circuit means having a supply terminal coupled to said associated terminal of said power source, an input terminal coupled to said second current path and an output terminal coupled to said first current path and operable to cause the current in said first current path to be proportional to the current in said second current path, and

current limiting means in said second current path to limit the maximum current flow therein to a predetermined maximum value.

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**4,314,197**

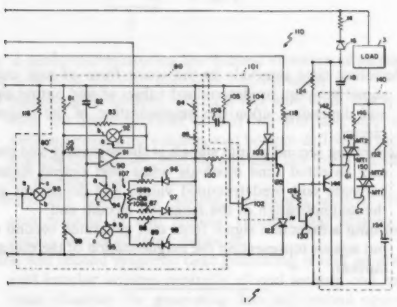
## ALTERNATING CURRENT POWER CONTROL CIRCUIT

**Louis M. Sandler, North Reading; Walter R. Spofford, Bedford, both of Mass., and Charles E. Scott, Noblesville, Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.**

**Division of Ser. No. 865,309, Dec. 28, 1977, abandoned. This application Mar. 29, 1979, Ser. No. 25,215**

**Int. Cl.³ G05F *3/04***

**U.S. Cl. 323—324** **3 Claims**



1. Circuit means for controlling the application of alternating current power to an apparatus, comprising:

triac means having a pair of main terminals adapted for being coupled in series between said apparatus and a source of alternating current power, said triac means also having a gate terminal;

non-regulated direct current power supply means adapted to receive alternating current power from said source thereof, said power supply means including rectifier means and filtering means and having a pair of output terminals for distributing direct current power;

means for maintaining an approximately constant load on said non-regulated direct current power supply means and switch current therefrom to said triac means gate terminal including semiconductor junction switching means having a gate terminal, a first main terminal coupled to one output terminal of said power supply means and said triac means gate terminal and a second main terminal coupled to the other output terminal of said power supply means; and

means coupled to said switching means gate terminal or activating and deactivating current flow in said switching means to deactivate and activate, respectively, current flow through said triac means by shunting current from said one terminal of said power supply means away from said triac means gate and to said other power supply means terminal thereby providing control of the application of alternating current power to said apparatus.

**4,314,198**

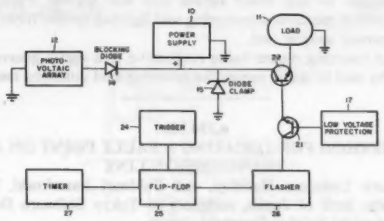
## SOLAR POWER SOURCE FOR A LIGHTING SYSTEM

**William E. Rogers, San Antonio, Tex., assignor to Solar Physics, Inc., San Antonio, Tex.**

**Filed Oct. 1, 1979, Ser. No. 80,405**

**Int. Cl.³ G05F *3/08*; H02J *7/32***

**U.S. Cl. 323—351** **5 Claims**




1. A solar recharged power supply circuit for a lighting system comprising:

a rechargeable power source operably connected to a lighting system operable at the same potential as said rechargeable power source;

an array of photovoltaic cells operably connected to said rechargeable power source for supplying charging current to said rechargeable power source;

diode means connected between said power source and said array of photovoltaic cells such that current flowing from said rechargeable power source to said array of photovoltaic cells is substantially blocked;

zener diode means operably connected between said power source and ground such that said zener diode means clamps the potential of said power source at its full potential;

means for disconnecting said power source from said lighting system if the potential of said power source drops below a predetermined value comprising means for comparing the potential of said power source with a reference voltage potential, and first transistor switch means connected to second transistor switch means operably connected between said power source and said lighting system wherein said first transistor switch means is responsive to a signal output from said comparing means and causes said second transistor switch means to disconnect said power source from said lighting system if said power source potential drops below a predetermined value represented by said reference voltage wherein said means for comparing includes a differential input operational amplifier with hysteresis having an output operably connected to said first transistor switch means, one input connected to said power source, the other input connected to said reference voltage potential, and a zener diode connected between said other input and ground for clamping said other input to a predetermined value;

timer means for generating pulses through said first transistor switch means to said second transistor switch means causing said second transistor switch means to intermittingly connect and disconnect said lighting system from said power source;

bi-stable signal generating means operably connected to said timer means wherein said timer means generates pulses to said second transistor switch means causing intermittent connect and disconnect between said lighting system and said power source in response to a signal from said bi-stable signal generating means;

trigger means operably connected to said bi-stable signal generating means for causing said signal generating means to generate a signal to said timer means;

second timer means for automatically disconnecting said lighting system from said power source after a predetermined time interval comprising counting means operably

connected to said bi-stable signal generating means, pulse generating means operably connected to said counting means such that said counting means counts pulses generated by said pulse generating means, said counting means including signal generating means for generating a signal to said bi-stable means when a predetermined number of pulses from said pulse generating means is counted by said counting means causing said bi-stable means to generate a signal to said timer means and said second transistor switch means disconnecting said lighting system from said power source; and,

said counting means being responsive to a signal generated by said bi-stable means for resetting said counting means.

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**4,314,199**

## METHOD FOR LOCATING A FAULT POINT ON A TRANSMISSION LINE

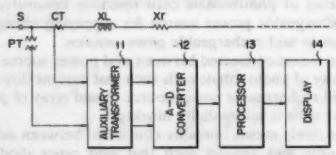
**Mitsuru Yamaura, Hachioji, and Yukinari Yamakoshi, Machida, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Oct. 24, 1979, Ser. No. 87,771**

**Claims priority, application Japan, Oct. 30, 1978, 53-132575**

**Int. Cl.³ G01R *31/08***

**U.S. Cl. 324—52** **7 Claims**




1. A method for locating a fault point on a transmission line comprising:

a first step for detecting a prefault current (first current) at one end of said transmission line and detecting a faulted voltage and a faulted current (second current) at said one end;

a second step for subtracting said prefault current (first current) from said faulted current (second current) to obtain a fault component current at said one end;

a third step for shifting the phase of said fault component current by a known phase angle to obtain a third current;

a fourth step for assuming an assumed fault point, subtracting an impedance voltage drop from said faulted voltage to obtain an assumed fault point voltage at said assumed fault point, said impedance voltage drop being a voltage drop caused by said faulted current (second current) between said one end and said assumed fault point; and

a fifth step for discriminating whether the phase of said assumed fault point voltage coincides approximately with the phase of said third current obtained in said third step or not, changing said assumed fault point, repeating said fourth step and said discriminating step until the phase of said assumed fault point voltage coincides approximately with the phase of said third current, and determining the assumed fault point at which the phase of said assumed fault point voltage coincides approximately with the phase of said third current to be said fault point.

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**4,314,200**

## METHOD AND APPARATUS FOR DETECTION OF MAGNETIZATION

**Alois Marek, Nussbaumen, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland**

**Filed Sep. 1, 1977, Ser. No. 829,811**

**Int. Cl.³ G01R *19/00, 33/00***

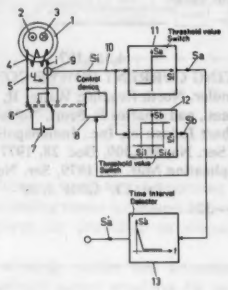
**U.S. Cl. 324—117 R** **31 Claims**

1. A method for the detection of magnetization of a magnetic circuit, especially for the detection of a current flow and which is coupled with the magnetic circuit and producing such magnetization, comprising the steps of:

generating by means of a detection voltage a detection-current flow which cyclically changes over time and having a wave form dependent upon the magnetization of the magnetic circuit, said detection-current flow being used for detection purposes;

said detection-current flow being coupled with the magnetic circuit;

converting said detection-current flow to a first output signal whose magnitude is dependent upon said detection-current flow;




detecting time intervals in the wave form of said output signal between predetermined values of said output signal and dependent upon the magnetization of the magnetic circuit;

generating second output signals at the beginning and end of said detected time intervals when said output signal is between said predetermined values and dependent upon the magnetization of the magnetic circuit; and

forming a detection signal from said generated second output signals representing the magnetization of the magnetic current.

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**4,314,201**

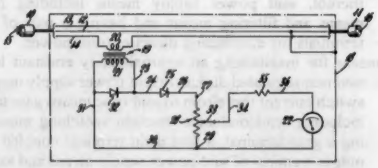
## POWER MEASURING APPARATUS

**Michael Marro, Plainview, and John Monin, Woodhaven, both of N.Y., assignors to Dynamic Instrument Corporation, Hauppague, N.Y.**

**Filed Apr. 14, 1980, Ser. No. 139,995**

**Int. Cl.³ G01R *15/02, 15/08, 19/22***

**U.S. Cl. 324—127** **4 Claims**



1. Alternating current power measuring apparatus for electric appliances comprising a male connector for engagement with a source of electric power, a female connector for attachment of an appliance to be energized, conductors interconnecting said female connector with said male connector, a transformer having a low impedance primary connected in series with one of said conductors and a higher impedance secondary, a potentiometer having a resistance element and a movable contactor electrically contacting said resistance element, means connecting said secondary to said resistance element to develop a voltage across said element proportional to the

current flowing through said primary and a voltage indicator connected between said movable contactor and one side of said resistance element for indicating current flowing through the primary of said transformer, said potentiometer being calibrated in terms of cost per kilowatt-hour and said meter being calibrated in terms of cost of operation of said appliance per hour of operation.

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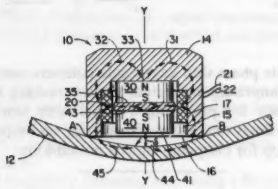
4,314,202

## FLEXURAL VIBRATION SENSOR WITH MAGNETIC FIELD GENERATING AND SENSING

Shigeo Okubo, 350 Sharon Park Dr., Apt. E24, Menlo Park, Calif. 94025

Filed Nov. 24, 1978, Ser. No. 963,476
Claims priority, application Japan, Aug. 7, 1978, 53-95474
Int. Cl.³ G01H *11/00*; G01B *7/14*; G01R *33/02*
U.S. Cl. 324—207 7 Claims




1. A sensor for measuring the flexural vibration of an associated structural member, said sensor comprising;

a magnetizable housing having a top, side walls and a bottom, the inner surfaces of said top and said side walls defining an interior volume, said bottom defining a peripheral contact surface, said top and said side walls providing an internal magnetic path;

electrically conductive sensing coil means secured within said housing in said interior volume, said sensing coil means having an inner diameter;

first and second magnetic field generating means secured in said interior volume centrally of said sensing coil means inner diameter for generating first and second opposing magnetic fields, said first magnetic field generating means having one pole positioned adjacent the inner surface of said top and the other pole positioned within said sensing coil means inner diameter so that said first magnetic field extends from said one pole upwardly into said top, outwardly to said side walls, downwardly within said side walls and radially through said sensing coil means to said other pole;

said second magnetic field generating means having one pole positioned adjacent said bottom and recessed within said interior volume and the other pole positioned within said sensing coil means inner diameter so that said second magnetic field extends from said one pole downwardly to the exterior of said housing, outwardly to said peripheral contact surface, upwardly within said side walls and radially through said sensing coil means to said other pole, the facing poles of said first and second magnetic generating means having the same polarity and being mutually spaced; and

pole piece means positioned between said facing poles and said inner diameter of said sensing coil means for providing a magnetic field path for the radially directed first and second magnetic fields,

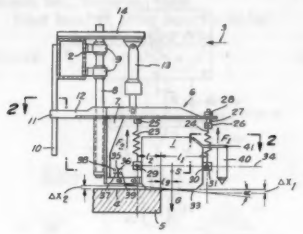
whereby variations in the strength in that portion of said magnetic field in the region exterior to said housing caused by flexural vibration of said associated structural member when said sensor is attached thereto are sensed by said electrically conductive coil means.

4,314,203

## TEST ARRANGEMENT FOR THE NON-DESTRUCTIVE TESTING OF METALLIC TEST PIECES

Peter Häberlein, Reutlingen, Fed. Rep. of Germany, assignor to Institut Dr. Friedrich Förster Prüfgerätebau, Fed. Rep. of Germany

Filed Apr. 9, 1979, Ser. No. 27,711
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1978, 2815228
Int. Cl.³ G01R *33/00*; G01N *27/82*
U.S. Cl. 324—262 12 Claims




1. In a test arrangement for the non-destructive defect testing of metallic test pieces, in particular slabs, billets and the like having surface irregularities, traction means move along the test piece surface carrying testhead mounting means with a testhead having at least one test probe, the bottom of the test probe being suited for sliding contact with the test piece surface and said testhead being towed by the testhead mounting means, the horizontal forces encountered between the testhead mounting means and the testhead being absorbed by a hinge joint which permits the testhead to swing at least about one axis vertical to the direction of movement and parallel to the test piece surface, and the vertical forces encountered between the testhead mounting means and the testhead being absorbed by separate connection means, the improvement comprising:

the separate connection means including two resilient elements acting upon the testhead, one at each side of the center of gravity of the testhead viewed along the direction of movement, the connecting line between the two points where said resilient elements act upon said testhead being located at a level higher than that of the testhead center of gravity, said testhead being urged toward the test piece by gravity and said two resilient means providing a resilient force opposing gravity;

means for varying the height of the testhead mounting means in relation to the traction means; and

means for keeping the testhead mounting means at a constant spacing with respect to the test piece surface.

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4,314,204

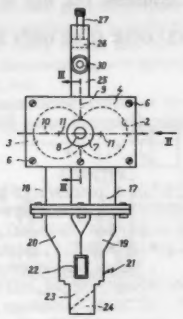
## RESONATOR FOR ELECTRON SPIN RESONANCE EXPERIMENTS

Reinhard Biehl, Kassel, and Dieter Schmalbein, Karlsruhe-Durlach, both of Fed. Rep. of Germany, assignors to Bruker Analytische Messtechnik GmbH, Rheinstetten, Fed. Rep. of Germany

Filed Apr. 29, 1980, Ser. No. 144,854
Claims priority, application Fed. Rep. of Germany, May 3, 1979, 2917794
Int. Cl.³ G01N *27/00*
U.S. Cl. 324—316 10 Claims

1. A resonator for electron spin resonance experiments in which two different wave modes of the same frequency can be excited, whose magnetic fields build up at least approximately perpendicular to each other in a certain area of the resonator in which the electrical field mostly vanishes if possible, and which is fitted with devices for exciting the two modes and has an aperture through which a test piece is inserted into the

abovementioned area whose centre is situated at the point of intersection of the two orthogonal planes of symmetry of the resonator, characterized in that the resonator has two cylindrical elements (2,3) of the same length arranged with axes parallel to each other (11) and with end faces in the same planes so that they partly merge with each other, in that the devices for



exciting the two modes are coupled to the two elements so that in each of the elements they excite a degenerate $TM_{010}$ mode and a degenerate $TE_{111}$ mode, and in that the aperture (8) for introducing a test piece is arranged in one of the end faces of the resonator and that of the two planes of symmetry (9,10), one forms the plane of intersection of the two elements and the other contains the axes (11) of the two elements.

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**4,314,205**

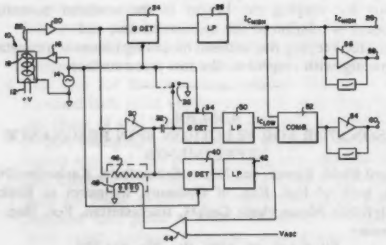
**METHOD AND MEANS FOR VACUUM GAUGING**

**Ronald M. Paitich, 639 Paco Dr., Los Altos, Calif. 94022, and Donald D. Briglia, 849 Timlott La., Palo Alto, Calif. 94306**

**Filed Nov. 19, 1979, Ser. No. 95,406**

**Int. Cl.³ G01N *27/00***

**U.S. Cl. 324—460** **17 Claims**



1. The method of measuring vacuum pressure with an ionization tube having a plurality of elements which are voltage biased whereby electrons are emitted and collide with gas molecules to form ions and whereby ions are collected by one of said elements comprising the steps of:

varying the voltage applied to at least one of said elements between a plurality of voltage levels,

measuring ion current at said plurality of voltage levels, and

determining vacuum pressure from a function of the ratio of ion currents at said plurality of voltage levels.

**4,314,206**

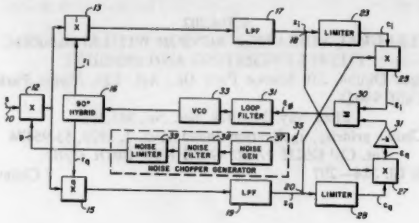
**NOISE CHOPPER FOR PREVENTING FALSE LOCKS IN A COHERENT CARRIER RECOVERY SYSTEM**

**Stanley W. Attwood, and James H. Stilwell, both of Scottsdale, Ariz., assignors to Motorola Inc., Schaumburg, Ill.**

**Filed Dec. 26, 1979, Ser. No. 106,566**

**Int. Cl.³ H03D *3/18***

**U.S. Cl. 329—50** **6 Claims**



4. A multiple phase shift keyed data coherent carrier recovery system comprising a coherent carrier tracking loop and a signal generator for providing a signal with non-stationary zero-crossing times with means connecting said signal generator to said loop for chopping signals in said loop.

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**4,314,207**

**TRANSISTOR AMPLIFIER**

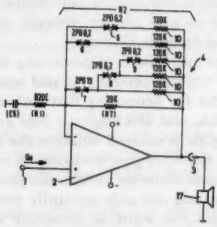
**Werner Pinternagel, Siemensstrasse 50, D-8440 Straubing, Fed. Rep. of Germany**

**Filed Jun. 18, 1979, Ser. No. 49,731**

**Claims priority, application Fed. Rep. of Germany, Oct. 31, 1978, 2847363**

**Int. Cl.³ H03G *3/00***

**U.S. Cl. 330—110** **5 Claims**



1. A transistor amplifier utilizing AC for an orchestral instrument, the amplifier having a predetermined range of operation in which modulation amplification is straightline constant up to a normal output beyond which the amplifier would normally be saturated, a feedback means, and an output voltage from the amplifier applied through the feedback means controlling the input, comprising,

a non-inverting input,

the feedback means including,

(a) a first path independent of transistors operative for feeding back an output voltage on the input for controlling the input up to the upper limit of said range,

(b) a supplementary path parallel with the first path and including a zener diode having a break-through point at the upper limit of said range,

(c) a plurality of auxiliary paths, having respectively different break-through points at different points beyond said range,

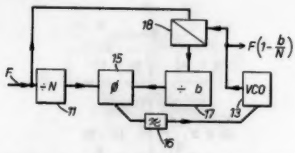
whereby the feedback means produces linear transition leading from, and beyond, said range, thereby supressing clipping.

## 4,314,208

## FREQUENCY ADJUSTING METHODS AND SYSTEMS

Peter J. Munday, Woodley, England, assignor to Racal Group Services Limited, Berkshire, England

Filed May 16, 1979, Ser. No. 39,685
Claims priority, application United Kingdom, May 26, 1978, 23471/78
Int. Cl.³ H03L 7/00
U.S. Cl. 331—1 A 13 Claims




1. A method of adjusting an output frequency to approximate to a desired frequency, the method comprising the steps of

generating an input frequency,

carrying out a first frequency changing step to change the said input frequency to an intermediate frequency,

simultaneously carrying out a second frequency changing step to change the intermediate frequency to an output frequency,

one said frequency changing step being a frequency division by an integer division factor and the other frequency changing step being a frequency multiplication by an integer multiplication factor differing from the division factor by an offset integer, and

simultaneously adjusting the division and multiplication factors within predetermined limits to values such that the ratio of the offset integer to the division factor is the closest available approximation within those limits to the difference between the input and desired frequencies expressed as a proportion of the input frequency, whereby the output frequency approximates to the desired frequency.

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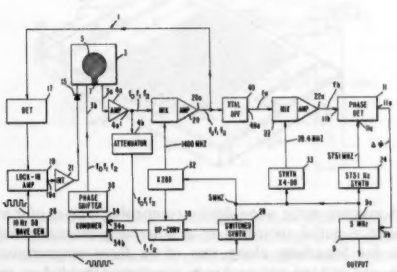
## 4,314,209

## Q-ENHANCED RESONANCE-STABILIZED MASER

Harry T. M. Wang, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 21, 1980, Ser. No. 141,846
Int. Cl.³ H03L 7/00
U.S. Cl. 331—3 17 Claims




1. A resonator having its frequency response centered about a selected frequency $f_0$ comprising:

an electromagnetically resonant cavity;

a tunable reactive element connected to said cavity so as to provide a reactive load for said cavity;

means for introducing into said cavity two test signals of frequencies $f_1$ and $f_2$ not equal to said selected frequency $f_0$;

means for generating an error signal proportional to the differential response of said cavity to said two test signals; and

means responsive to said generating means for changing the reactance of said tunable element so as to null said error signal.

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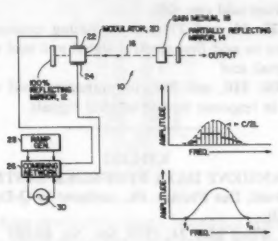
## 4,314,210

## MODE-LOCKING AND CHIRPING SYSTEM FOR LASERS

Patrick N. Everett, Concord, Mass., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Nov. 23, 1979, Ser. No. 96,747
Int. Cl.³ H01S 3/10
U.S. Cl. 372—18 13 Claims




1. Apparatus for providing mode-locking in the resonant cavity of a radiation producing laser and for chirping its output so as to give the laser a substantially continuous energy spectrum over the frequency of said radiation comprising:

an electro-optical element disposed in said cavity, said element having an index of refraction which is variable as a function of an applied voltage, said element having a single pair of electrodes for applying said voltage; and,

means for simultaneously applying a d.c. voltage ramp and a periodically varying voltage to said electrodes, said periodically varying voltage having a frequency for effecting mode-locking in said cavity thereby to produce mode-locked spectral mode lines, and said d.c. voltage ramp being such as to displace said mode-locked spectral mode lines of said laser by an amount at least as great as the mode line separation to provide said continuous energy spectrum.

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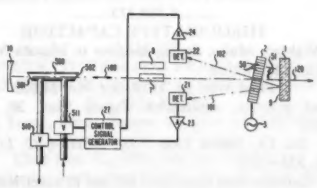
## 4,314,211

## SERVO-CONTROLLED OPTICAL LENGTH OF MODE-LOCKED LASERS

Linn F. Mollenauer, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 24, 1980, Ser. No. 115,136
Int. Cl.³ H01S 3/13
U.S. Cl. 372—32 7 Claims




1. A mode-locked laser comprising:

at least two mirrors (10, 1) disposed to form a laser cavity having an optical path length;

a laser medium (7) disposed within said laser cavity;

means (8) for exciting said laser medium to form an internal laser cavity pulse;

a transducer (2) disposed in said laser cavity;

means (3) for generating a standing wave in said transducer, whereby radiation from said internal laser cavity pulse is scattered out of said laser cavity on either side of said internal laser cavity pulse;

characterized in that

said laser further includes a first radiation detector (21) for generating a first electric signal in response to a portion (101) of the radiation scattered to one side of said internal laser cavity pulse (100);

a second radiation detector (22) for generating a second electric signal in response to a portion (102) of the radiation scattered to the other side of said internal laser cavity pulse from said one side;

(means (23, 24, and 27) for producing control signals in response to said first electric signal and said second electric signal; and

means (500, 510, and 511) for adjusting said optical path length in response to said control signals.

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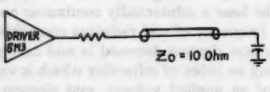
## 4,314,212

## TRANSIENT DATA RECORDER SYSTEMS

David A. Gradl, Des Plaines, Ill., assignor to Q-Dot, Inc., Des Plaines, Ill.

Filed May 31, 1979, Ser. No. 44,061
Int. Cl.³ H01P 5/02; H03H 11/40, 17/00
U.S. Cl. 333—20 3 Claims




1. In a circuit including a charge coupled device having a transport electrode array and a high frequency driver for said transport electrode array, the improvement comprising a coupling circuit for coupling said transport electrode array of said charge coupled device to said high frequency driver for said transport electrode array, comprising a coaxial cable having a length of less than about 1.5 inches for making electrical connection with said electrode array and having an impedance in the range of from about 0.5 Zo' to about 2 Zo' and a resistor having a resistance in the range of from 0.5 Zo' to 2 Zo' connecting said driver to said coaxial cable, where

$$Zo' = Xc\left[\tan BL + \sqrt{1 + \tan BL}\right]$$

and where Xc is the capacitive termination reactance to the cable, B is the cable line phase constant, and L is the cable line length.

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## 4,314,213

## THROUGH-TYPE CAPACITOR

Kikuo Wakino, Muko, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

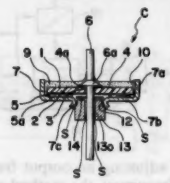
Filed Mar. 26, 1979, Ser. No. 24,023
Claims priority, application Japan, Mar. 30, 1978, 53-42156[U]
Int. Cl.³ H03H 3/00, 7/01; H01G 4/42, 1/02
U.S. Cl. 333—182 10 Claims

5. A through-type capacitor for use in electrical and electronic equipment, said capacitor comprising:

a housing of metallic material having first and second openings and a stepped portion provided therebetween;

a capacitor element located in said housing, said capacitor element comprising a dielectric member having an opened end formed therein, and first and second electrode means formed on two opposite surfaces thereof, respectively;

a central conductor member inserted through said opening in said dielectric member and secured in such position, said central conductor member being electrically connected to said first electrode means, said second electrode means being electrically connected to the interior of said housing;




plug means through which said central conductor member extends and which is fixed with respect to said housing so as to obstruct said second opening of said housing at least partially, said plug means being made of a magnetizable material; and

a resin material closing said first opening of said housing.

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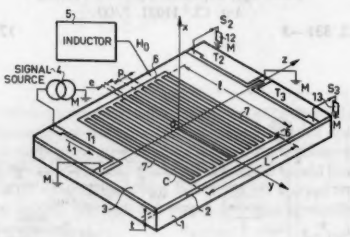
## 4,314,214

## MAGNETOSTATIC-WAVE DEVICE COMPRISING A CONDUCTING STRIP EXCHANGE STRUCTURE

Jean P. Castera; Pierre Hartemann, and Jean M. Dupont, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jul. 3, 1980, Ser. No. 166,698
Claims priority, application France, Jul. 6, 1979, 79 17602
Int. Cl.³ H03H 2/00
U.S. Cl. 333—141 25 Claims



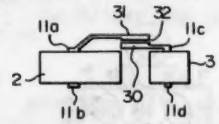

1. A magnetostatic wave device comprising a layer of ferromagnetic material subjected to a polarizing magnetic field, means for launching along one of its faces magnetostatic waves, and at least one exchange structure provided on said one face; said structure comprising an array of N adjacent conducting strips having N first ends and N second ends and further comprising conducting means electrically interconnecting said N first ends and said N second ends for causing a current induced by said magnetostatic waves in any one of said N conducting strips to loop inside said exchange structure; the arrangement of said strips being such that they take on the form of the incident wavefronts of said magnetostatic waves over at least a part of their length.

4,314,215

## SURFACE ACOUSTIC WAVE FILTER DEVICE WITH EQUALIZATION OF STRAY COUPLING

Shigeo Tanji, Yokohama; Noboru Wakatsuki, Kawasaki, and Hideki Tominaga, Suzaka, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 11, 1980, Ser. No. 168,324
Claims priority, application Japan, Jul. 20, 1979, 54-92292
Int. Cl.³ H03H 9/64, 9/25, 9/145, 9/42
U.S. Cl. 333—193 9 Claims




1. A surface acoustic wave filter device, comprising:
a filter chip comprising an input transducer and an output transducer, each composed of a pair of interdigitated electrodes and formed on a piezo-electric substrate;
a casing in which said chip is mounted;
a plurality of externally leading input and output terminals, said terminals being connected to said chip and leading through said casing, said input terminals being connected to said input transducer and said output terminals being connected to said output transducer;
a balanced-type differential amplifier connected to said output transducer through said externally leading output terminals;
means for capacitatively coupling at least one of said input terminals with at least one of said output terminals, thereby to equalize the level of signals which are induced on said output terminals of said output transducer without having assumed the form of surface acoustic waves.

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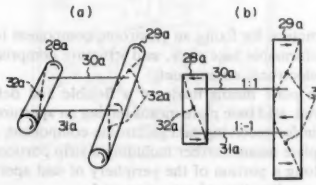
4,314,216

## MECHANICAL FILTER

Takashi Gounji, Kawasaki; Yoshihiko Kasai, Yokohama, and Kenji Shirai, Ebina, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 9, 1979, Ser. No. 92,855
Claims priority, application Japan, Nov. 13, 1978, 53-139648; Dec. 4, 1978, 53-149866; Dec. 4, 1978, 53-149868
Int. Cl.³ H03H 9/50, 9/24
U.S. Cl. 333—198 15 Claims




1. A mechanical filter comprising at least a pair of mechanical vibrators which are so arrayed that their longitudinal axes are substantially parallel to each other and which vibrate in the same mode of vibration, a first coupler which is arrayed at substantially right angles to said pair of mechanical vibrators together in phase, and a second coupler which is arrayed at substantially right angles to said pair of mechanical vibrators and couples said pair of mechanical vibrators together in anti-phase, and wherein the first and second couplers are connected to said pair of mechanical vibrators on mutually corresponding side surfaces of said pair of mechanical vibrators, and wherein the phase of both said first coupler and said second coupler does not change between said pair of said mechanical vibrators.

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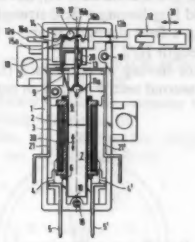
4,314,217

## LOCKING DEVICE

Fritz Krasser, Altdorf, Fed. Rep. of Germany, assignor to Ellenberger & Poensgen GmbH, Altdorf, Fed. Rep. of Germany

Filed Aug. 1, 1979, Ser. No. 63,114
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1978, 2833860
Int. Cl.³ H01H 3/42
U.S. Cl. 335—188 17 Claims



1. In a locking device including a housing, a plunger slidably supported in the housing for displacement in a first direction between two end positions; an electromagnet disposed in the housing and having a solenoid and an armature displaceable in a second direction by the force of a magnetic field generated upon energization of the solenoid; and coupling means for operatively connecting the armature with the plunger for affecting the position of the plunger dependent upon the position of the armature; the improvement wherein said coupling means comprises a switch-over device having two stable end positions and being force-transmittingly connected to said plunger; said switch-over device comprising
(a) a slide supported in said housing for displacement by said armature in said second direction;
(b) an extension connected with said plunger and supported in said housing for displacement in a third direction which is perpendicular to said second direction;
(c) a first pin affixed to said slide;
(d) a second pin affixed to said extension;
(e) a compression spring engaging said first and second pins in an over-the-center arrangement for maintaining said extension in position in either end position of said plunger;
(f) an abutment face of inverted W shape forming part of said extension and oriented towards said slide; and
(g) a resilient lug affixed to said slide and extending to said abutment face for engagement therewith to transmit a displacement force to said extension in said third direction upon movement of said slide toward said extension, whereby in either end position of said plunger the force of said compression spring is overcome and said extension, together with said plunger, is moved such that the plunger is displaced towards its other end position.

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4,314,218

## MAGNETIC SYSTEM FOR REARRANGING OR REGROUPING CHARGED PARTICLES WITHIN A PULSED BEAM

Dominique Tronc, Paris, France, assignor to CGR-MeV, Buc, France

Filed Dec. 12, 1979, Ser. No. 102,900
Claims priority, application France, Dec. 15, 1978, 78 35383
Int. Cl.³ H05B 31/26; H05H 1/10
U.S. Cl. 335—210 7 Claims

1. A magnetic system for regrouping or rearranging the charged particles of an incident beam of such particles so as to

provide an exit beam having high density particle bunches, comprising:

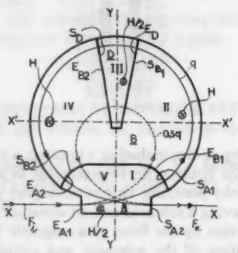
an electromagnet including first, second and third pairs of polepieces;

the polepieces being arranged so that the polepieces of said first and third pairs interpenetrate the polepieces of said second pair;

all pairs of polepieces having a common plane of symmetry perpendicular to a first axis defined by the average incident and emergent paths of said beam;

the polepieces defining successive air gaps forming successive first, second, third, fourth, and fifth sectors in which are created, respectively, a first field $H_I$ having a field strength H/2, a second field $H_{II}$ having a field strength H, a third field $H_{III}$ having a field strength H/2, a fourth field $H_{IV}$ having a field strength H and a fifth field $H_V$ having a field strength H/2,

the first sector having an entry face ($E_{A1}$) and an exit face ($S_{A1}$), the second sector having an entry face ($E_{B1}$) and an



exit face ($S_{B1}$), the third sector having an entry face ($E_D$) and an exit face ($S_D$), the fourth sector having an entry face ($E_{B2}$) and said exit face ($S_{B2}$), and the fifth sector having an entry face ($E_{A2}$) and an exit face ($S_{A2}$), said entry face ($S_{A1}$) and exit face ($E_{A2}$) being on an arc of a circle having a radius $r=R_q \cdot tg(\alpha_q/2)$, where $R_q$ and $\alpha_q$ represent respectively the radius of curvature and the deflection angle of the paths in the air gap of said first pair of polepieces for elections having a momentum q;

the successive sectors providing a plurality of loop-like paths for an incident beam entering through entry face ($E_{A1}$) and exiting through exit face ($S_{A2}$), the path length of each path being determined as a function of the momentum q of a particle traveling thereon, the different path lengths resulting in the bunching of particles emerging from exit face ($S_{A2}$) so that they are longitudinally compressed with respect to particles incident at entry face ($E_{A1}$); and wherein the electromagnet is provided with an annular coil in the air gap of said first, second, and third polepieces.

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**4,314,219**

**PERMANENT MAGNET TYPE LIFTING DEVICE**

**Tosimichi Haraguchi, Saitama, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan**

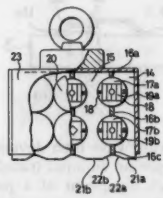
**Filed Sep. 25, 1979, Ser. No. 78,620**

**Claims priority, application Japan, Apr. 17, 1979, 54-51165[U]; May 21, 1979, 54-68064[U]**

**Int. Cl.³ H01F *7/04*; B25B *11/00***

**U.S. Cl. 335—295** **2 Claims**

1. A permanent magnet type lifting device, comprising a plurality of magnetic members said plurality of magnetic members being isolated from one another by non-magnetic members, each pair of adjacent magnetic members defining with said isolating, non-magnetic members a plurality of vertically aligned internal circular openings, said plurality of magnetic members thereby defining a plurality of horizontally and vertically disposed internal circular openings, a plurality of permanent magnet assemblies corresponding to and rotatably disposed within said plurality of internal circular openings in such a manner as to be rotatably in contact with said magnetic members through pole pieces thereof, each of said permanent magnetic assembly comprising a plurality of plate-shaped permanent magnets disposed in parallel to form a single unit and two pole pieces made of a magnetically permeable material provided adjacent respective end faces of said one unit, said two pole pieces having their outer surfaces shaped so as to be complementary with the shape of the walls of said circular



opening and the arrangement of said plate-shaped magnetics and said pole pieces being such that said plate-shaped magnetics do not slide against the walls of said circular openings, means for rotating said plurality of permanent magnet assemblies in such a manner than like magnetic poles thereof are confronted with each other through said magnetic members and a magnetic flux concentrating portion formed at the attracting surface of each magnetic member, said magnetic flux concentrating portion comprising an inclined portion formed at said attracting surface of each magnetic member.

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**4,314,220**

**FIXING STRUCTURE OF ELECTRONIC COMPONENT**

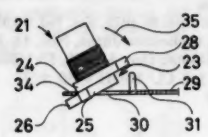
**Katsuo Ito, Kanazawa, and Kazunori Yoshimura, Nonoichi, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan**

**Filed Jan. 23, 1980, Ser. No. 114,496**

**Claims priority, application Japan, Feb. 9, 1979, 54/16497[U]**

**Int. Cl.³ H01F *15/02***

**U.S. Cl. 336—65** **14 Claims**



1. A structure for fixing an electronic component to a flexible and deformable base plate, said structure comprising:

(A) an electronic component;

(B) base plate means made of a flexible and deformable material; said base plate means having an aperture formed therein for receiving said electronic component; and said base plate means further including a strip portion extending along a portion of the periphery of said aperture and having a direction of extension; and

(C) said electronic component including:

(1) a base portion for insertion into said aperture, said base portion being so formed that it can be inserted into said aperture only a predetermined distance; and

(2) a protrusion extending from said base portion; said protrusion and said strip portion cooperating in such a manner that when said base portion is inserted into said aperture, said protrusion engages said strip portion and deforms said strip portion in a manner such that the width of said aperture as measured in the direction parallel to said direction of extension of said strip portion is reduced to such an extent that said base portion is gripped by at least a portion of the periphery of said

aperture, whereby said electronic component is secured firmly in said aperture.

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**4,314,221**

## INDUCTANCE DEVICE

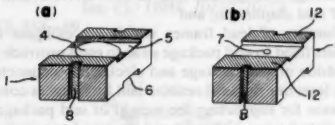
**Hiroshi Satou, and Tadao Yahagi, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan**

**Filed Sep. 17, 1980, Ser. No. 188,263**

**Claims priority, application Japan, Sep. 17, 1979, 54/128174[U]**

**Int. Cl.³ H01F *15/02, 15/10***

**U.S. Cl. 336—83** **4 Claims**




1. An inductance device which comprises a drum core on which a coil is wound and which has a projection; a rectangular pot core having each concave part on the upper surface and the lower surface and having a hollow for fitting said drum core and a hole for fitting said projection of said drum core; electrode parts which are respectively formed on each side surface and said concave part of the upper surface of said pot core and on the bottom surface of said pot core; said drum core having said coil being fitted into said hollow of said pot core; and said coil being connected to said electrode parts at said concave part by each of lead terminals of said coil; and said drum core being sealed in said hollow.

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**4,314,222**

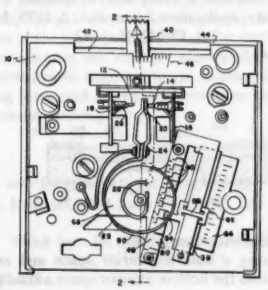
## THERMOSTAT ANTICIPATOR IMPROVEMENTS

**Allen L. Teichert, Placentia, Calif., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed Oct. 3, 1979, Ser. No. 81,545**

**Int. Cl.³ H01H *37/14***

**U.S. Cl. 337—107** **3 Claims**



1. In a thermostat having a temperature responsive switch and a bimetallic actuator therefor, and an anticipator circuit for heating said bimetallic actuator during a preselected one of on or off periods of said temperature responsive switch, the improvement comprising:

a metal radiator positioned with a major portion of its area located immediately beneath said bimetallic actuator in direct heat exchange contact with said resistive heating element, and said radiator is bonded to a U-shaped assembly with a first bar located proximate to said metal radiator and a second slide bar parallel thereto, a resistive heating element mounted on said first bar and including a thin metallic ribbon resistive conductor adhesively bonded to said first bar by an insulating film, and at least a portion of which is located immediately beneath said bimetallic actuator, said resistive conductor providing a plurality of electrical pads spaced at substantially equal increments along its length and separated by an equal plurality of open areas spaced along its length to provide a preselected decrease in the cross-sectional area of said resistive conductor, and a wiper arm is slidably carried on said slide bar with a contact arm extending into electrical contact with said resistive element, whereby movement of said wiper arm along said slide bar provides a resistivity which increases nonlinearly with distance along the length of said resistive conductor, and said metal radiator heats said bimetallic actuator accordingly.

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**4,314,223**

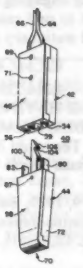
## THERMAL PROTECTIVE DEVICE FOR LIGHTING FIXTURES

**Paul J. Kristofek, Hickory Hills, Ill., assignor to McGraw-Edison Company, Rolling Meadows, Ill.**

**Filed Dec. 11, 1980, Ser. No. 215,163**

**Int. Cl.³ H01H *61/01***

**U.S. Cl. 337—113** **13 Claims**



1. A device for interrupting current to the electrical circuit of an electrically operated, heat generating appliance such as, an electrical lighting fixture when the temperature at a preselected location in said appliance reaches a predetermined level, said device including in combination;

a receptacle located generally at said preselected location including first terminal means connected electrically to said circuit;

a plug adapted for joinder with said receptacle including second terminal means connectable with said first terminal means upon joining said receptacle and plug and thermal protector means connected electrically to said second terminal means, said thermal protector means being operable to open said circuit at said predetermined temperature level; and

latch means included in said receptacle and plug, operable to secure said receptacle and plug in disengagable relation in response to the engagement of said first and second electrical terminal means.

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**4,314,224**

## THERMALLY ACTUATABLE ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

**Emil R. Plasko, Washington Township, Montgomery County, Ohio, assignor to Emerson Electric Company, St. Louis, Mo.**

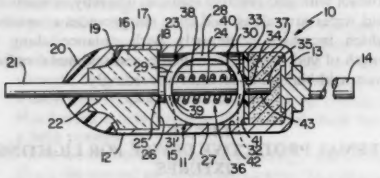
**Filed Dec. 31, 1979, Ser. No. 108,545**

**Int. Cl.³ H01H *37/76***

**U.S. Cl. 337—408** **34 Claims**

1. In a thermally actuatable electrical switch construction having a resilient contact member normally biased into electrical contact with a stationary contact member while a temperature sensitive member of said construction is in a solid condi-

tion and normally tending to spring out of contact with said stationary contact member by the natural bias of said resilient contact member when said temperature sensitive member is rendered non-solid by sensing a temperature above a predetermined temperature, said construction carrying guide means operatively associated with said resilient contact member to provide a guide for said resilient contact member that will



substantially insure that said resilient contact member will move and be maintained out of contact with said stationary contact member after said temperature sensitive member has been rendered non-solid, the improvement wherein said guide means comprises a spring engaging and acting on said resilient contact member to tend to pull said resilient contact member out of contact with said stationary contact member.

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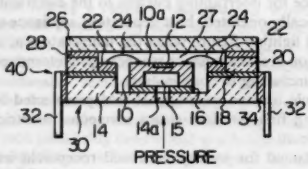
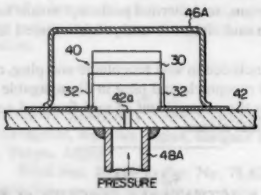
**4,314,225**

## PRESSURE SENSOR HAVING SEMICONDUCTOR DIAPHRAGM

**Tamotsu Tominaga, and Teruyoshi Mihara, both of Yokohama, Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan**

**Filed Jul. 9, 1979, Ser. No. 55,755**
**Claims priority, application Japan, Aug. 10, 1978, 53-96722**
**Int. Cl.³ G01L 1/22**
**U.S. Cl. 338—4** **9 Claims**





1. A pressure sensor comprising:

(a) a probe assembly comprising

(i) a pressure-sensitive element comprising a block of a crystalline semiconductor a portion of which takes the form of a diaphragm having front and back sides and at least one diffused resistor formed in a surface region on said front side of said diaphragm;

(ii) a package made up of at least two structural members integrated into a lidded box-like structure, said structural members being each made of an electrically nonconductive material whose coefficient of linear expansion is nearly equal to the coefficient of linear expansion of said crystalline semiconductor, said block of said pressure-sensitive element being confined in the interior of said package and bonded to one of said at least two structural members such that said diaphragm is entirely spaced apart from the inside of said package and that a hermetically closed first space is defined between the inside of said package and said front side of said diaphragm, said space being kept at a predetermined pressure so as to serve as a reference pressure chamber, said one of said at least two structural members further including a first hole bored therethrough in such a position that a fluid pressure subject to measurement can be admitted into the interior of said package through said hole so as to arrive at said back side of said diaphragm; and

(iii) a plurality of lead frames which are elongate metal members fixed to said package so as to each protrude from the outside of said package and electrically connected to said at least one diffused resistor said lead frames comprising means for supporting the weight of said package;

(b) a base plate having a plurality of electrical terminals, said lead frames being respectively fixed to said base plate at said electrical terminals such that said package is supported by said lead frames in a state entirely spaced from said base plate;

(c) a cap fixed to said base plate such that a second space is defined between said cap and said base plate and that said probe assembly is entirely confined in said second space and spaced from the inside of said cap, one of said cap and said base plate having a second hole bored therethrough so as to open into said second space; and

(d) a pipe fixed to said one of said cap and said base plate such that the interior of said pipe communicates with said second space only through said second hole to introduce said fluid pressure into said second space.

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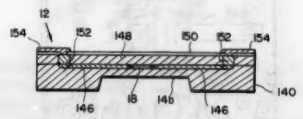
**4,314,226**

## PRESSURE SENSOR

**Takeshi Oguro, Yokosuka; Teruyoshi Mihara; Tamotsu Tominaga, both of Yokohama, and Masami Takeuchi, Kokubunji, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Jan. 4, 1980, Ser. No. 109,489**
**Claims priority, application Japan, Feb. 2, 1979, 54-11583[U]**
**Int. Cl.³ G01L 1/22**
**U.S. Cl. 338—4** **5 Claims**



1. A pressure sensor comprising:

a package having a hollow interior space and an inlet for introducing into the hollow interior space a fluid pressure to be measured;

a silicon diaphragm block confined within and bonded to the interior space of said package, said diaphragm block including a diaphragm spaced from the inside of said package;

said diaphragm including a base layer, said base layer including a pressure-sensitive element comprising a diffused resistor on a surface thereof, and a protective layer opposite in conductive type to said resistor and covering said diffused resistor;

a plurality of aluminum electrodes extending through said protective layer;

an internal diffused layer being of the same conductive type as said diffused resistor and disposed substantially between said base and said protective layer, said internal diffused layer electrically connecting said aluminum electrodes and said diffused resistor; and

diffused areas in said protective layer surrounding said aluminum electrodes, said diffused areas being opposite in conductive type to said protective layer and formed by diffusing said aluminum electrodes by a heat treatment into said protective layer.

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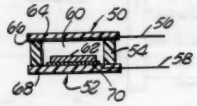
**4,314,227**

## ELECTRONIC PRESSURE SENSITIVE TRANSDUCER APPARATUS

**Franklin N. Eventoff, 2351 Lakeview Ave., Los Angeles, Calif. 90039**

**Filed Sep. 24, 1979, Ser. No. 78,323**
**Int. Cl.³ H01C** *10/10, 10/12*
**U.S. Cl. 338—99** **9 Claims**




1. A pressure responsive analog transducer comprising:
a first contact;
a second contact;
at least one semiconducting layer comprising at least a pressure sensitive semiconductor particulate material, the semiconducting laye. disposed in normally spaced relationship with at least one of the first and secon contacts, the semiconducting layer having a surface positioned in normally non-electrically-conducting relationship with at least one of the first and second contacts, the surface having a multiplicity of microprotrusions extending therefrom, each providing a minute contact location, at least one of the first contact, second contact and semiconducting layer being resiliently responsive to an external pressing force for causing the multiplicity of microprotrusions extending from the surface of the semiconducting layer and at least one of the first and second contacts to variably press against one another to define a variably electrically resistive junction so that electricity conducts between the first and second contacts through the minute contact location of the microprotrusions on the surface so that the resistance across the variably electrically resistive junction decreases in response to an increase in the external pressing force and increases in response to a decrease in the external pressing force.

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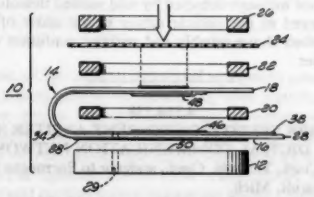
**4,314,228**

## PRESSURE TRANSDUCER

**Franklin N. Eventoff, 2351 Lake View Ave., Los Angeles, Calif. 90039**

**Filed Apr. 16, 1980, Ser. No. 140,937**
**Int. Cl.³ H01C** *10/10*
**U.S. Cl. 338—14** **16 Claims**




1. A pressure transducer device comprising:
a housing defining a chamber with a bottom surface and side walls;
a first conductor positioned adjacent the bottom surface of the chamber;
a flap having an upper and lower surface generally parallel with the bottom surface and a hinge region for movably attaching the flap at a spaced location above the bottom surface to extend from a side wall into the chamber, the flap being movable in the chamber about the hinge region;
a second conductor disposed on the lower surface of the flap;
a pressure responsive semiconducting composition layer disposed for covering at least one of the first conductor and the second conductor; and
a diaphragm attached about its periphery to the housing in spaced relationship to the bottom surface for enclosing the chamber, the diaphragm adhesively attached to the upper surface of the flap at a center region laterally spaced from the housing, the second conductor being variably movable with the flap into electrically conducting relationship with the first conductor by the diaphragm in response to variations in pressure force exerted against the diaphragm.

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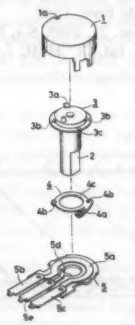
**4,314,229**

## FADER CONTROLLING VARIABLE RESISTOR

**Atsushi Kawasaki, and Yukio Munakata, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Jul. 19, 1979, Ser. No. 58,653**
**Claims priority, application Japan, Jul. 21, 1978, 53-88263; Jul. 21, 1978, 53-88264; Jul. 21, 1978, 53-99647[U]; Jul. 21, 1978, 53-99648[U]; Jul. 21, 1978, 53-99649[U]; Aug. 16, 1978, 53-99121; Aug. 16, 1978, 53-111479[U]; Aug. 16, 1978, 53-111480[U]**
**Int. Cl.³ H01C** *10/30*
**U.S. Cl. 338—160** **3 Claims**



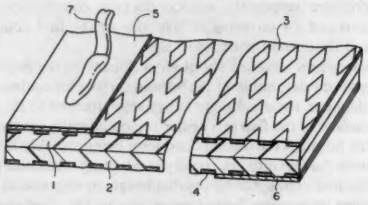

1. A variable resistor comprising: a casing, a mounting board, a conductive element mounted on said mounting board and having a sliding member, a substrate having terminals and a resistance member mounted thereon, said sliding member disposed so as to contact said resistance member, and heat responsive deformable means adapted to discontinue the contact between said sliding member and said resistance member when the temperature of said resistance member exceeds a predetermined level, wherein said heat responsive deformable means includes a section of said mounting board adapted to be responsive to the generation of heat and deform in order to discontinue contact between the sliding member and the resistance member, said mounting board including a thin wall section made of a heat responsive material, and a cavity adjacent said thin wall section.

4,314,230

## DEVICES COMPRISING CONDUCTIVE POLYMERS

Raymond F. Cardinal, Fremont, and Jack M. Walker, Portola Valley, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 31, 1980, Ser. No. 174,136
Int. Cl.[3] H01C 1/012
U.S. Cl. 338—314 43 Claims




1. An electrical device which comprises (1) an element composed of a conductive polymer composition; (2) a flame-sprayed layer of a material which at 25° C. has a resistivity of at most $5\times10^{-2}$ ohm.cm, said layer being at least one mil thick; and (3) a foraminous element at the interface between said conductive polymer element (1) and said flame-sprayed layer (2); there being electrical and direct physical contact between said conductive polymer element (1) and said flame-sprayed layer (2) in interstices of said foraminous element (2).

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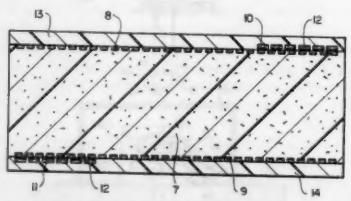
4,314,231

## CONDUCTIVE POLYMER ELECTRICAL DEVICES

Robert J. Walty, Redwood City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 21, 1980, Ser. No. 141,990
Int. Cl.[3] H01C 1/14
U.S. Cl. 338—328 26 Claims



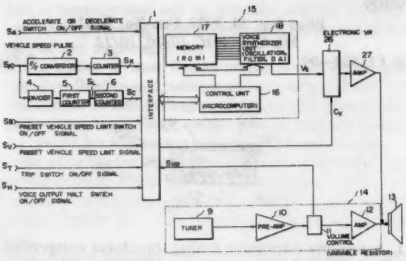

1. An electrical device comprising:
(a) a conductive polymer element comprising conductive particles dispersed in a polymer matrix;
(b) an electrode having a plurality of openings therein secured to the surface of said element;
(c) a conductor having a plurality of openings superimposed over at least a portion of said electrode and conductive element and bonded thereto with an electrically conductive adhesive; and
(d) a layer of polymeric material covering said conductor and interpenetrating the openings of said conductor and electrode, said polymeric material bonding to said conductive element, electrode and conductor, thereby retaining said conductor in electrical contact with said electrode and conductive element.

4,314,232

## VOICE WARNING SYSTEM FOR AN AUTOMOTIVE VEHICLE

Masakazu Tsunoda, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Oct. 23, 1980, Ser. No. 199,710
Claims priority, application Japan, Oct. 24, 1979, 54-136430
Int. Cl.[3] G08B 3/10
U.S. Cl. 340—52 F 7 Claims




1. A voice warning system for an automotive vehicle wherein an automatic vehicle speed control device is incoporated for increasing or decreasing the vehicle speed to a speed desired by the driver while an accelerate or decelerate switch in the automatic vehicle speed control device is turned on and for maintaining automatically the desired speed set when the accelerate or decelerate switch is turned off, which comprises:
(a) a first detector for detecting an instantaneous vehicle speed from vehicle speed pulses of a vehicle speed sensor;
(b) a signal generator for generating a signal corresponding to speed limit preset by the vehicle driver;
(c) a second detector for detecting a trip distance the automotive vehicle has traveled whenever a predetermined interval of distance is reached after a trip switch is turned on;
(d) a voice selector connected to said first and second detectors and signal generator for selectively outputting a voice signal first according to the output signal from said first detector when the accelerate or decelerate switch is turned on and a signal representing a driver desired vehicle speed set when the accelerate or decelerate switch is turned off, secondly according to the output signal from said signal generator and lastly according to the output signal from said second detector; and
(e) a voice output controller connected to said voice selector for outputting a message at a suitable volume according to the voice signal from said voice selector,
whereby automatic vehicle speed control information such as an instantaneous vehicle speed while the accelerate or decelerate switch is turned on and a driver desired speed set when the accelerate or decelerate switch is turned off, vehicle speed warning message obtained when the actual vehicle speed exceeds the preset speed limit, and a trip distance message detected by said second detector can be conveyed to the vehicle driver in the order of priority described above reliably and without confusion with one another.

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4,314,233

## FOUR-WIRE SPEED INDEPENDENT ARBITER SWITCH FOR DIGITAL COMMUNICATION NETWORKS

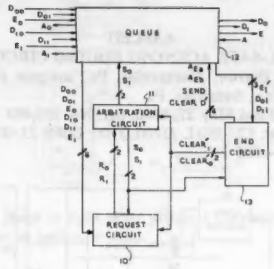
Becky J. Clark, Tualatin, Oreg., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 18, 1979, Ser. No. 104,964
Int. Cl.[3] H04Q 9/00; H04J 6/00
U.S. Cl. 340—825.02 7 Claims

1. An arbitration switch for receiving sequential sets of data

signals from two different nodes of a digital communication network and transmitting those signals to a third node, said sets including a first set of data signals, each set of data signals including an end signal, said switch comprising:

queue means coupled to receive the respective sets of data signals from each of said two nodes;




an arbitration circuit coupled to said respective nodes to receive said respective sequential sets of data signals and to signal said queue means to select the first set of the data signals to be received for subsequent transmission to said third node; and

end circuit means to detect the end signal of the first set of data signals and clear the switch for subsequent reception of another set of data signals.

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**4,314,234**

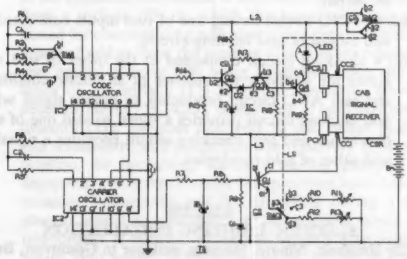
## TEST SET FOR RAILWAY CAB SIGNAL SYSTEM

**John O. G. Darrow, Murrysville, and Joseph J. Pierro, Dayton, both of Pa., assignors to American Standard Inc., Swissvale, Pa.**

**Filed Dec. 17, 1979, Ser. No. 103,885**

**Int. Cl.³ H04B *17/00*; G01R *27/26*; H04Q *1/20***

**U.S. Cl. 340—825.36** **16 Claims**




1. A test set for railway cab signal equipment comprising, a code oscillating circuit for producing code signals, a carrier oscillating circuit for producing carrier signals which are modulated by the code signals for producing coded carrier signals, a current source having an input and an output, the coded carrier signals fed to the input of said current source, the output of said current source connected across a pair of pickup coils of the cab signal receiver for verifying the integrity of the pair of pickup coils and for checking the sensitivity of an amplifier of the cab signal receiver.

**4,314,235**

## SYSTEM FOR UTILIZING A CONVENTIONAL N-BIT SUCCESSIVE APPROXIMATION REGISTER TO GENERATE DATA WORDS WITH MORE THAN N PLACES

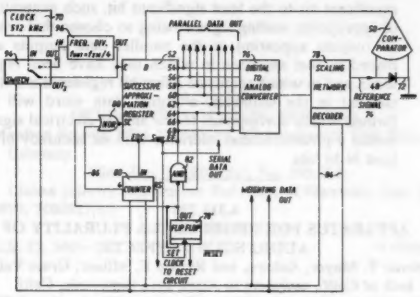
**Wolfgang Ruf, Munich, and Eduard Wagensonner, Aschheim, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jan. 30, 1980, Ser. No. 116,801**

**Claims priority, application Fed. Rep. of Germany, Jan. 31, 1979, 2903728**

**Int. Cl.³ H03K *13/02***

**U.S. Cl. 340—347 AD** **3 Claims**




1. A system for using a conventional clocked N bit successive approximation register to continuously sample an analog electrical signal at discrete intervals and to convert the sampled analog electrical signal to a corresponding digital data word which differs from the analog electrical signal by at least a predetermined tolerance, when the analog electrical signal spans a dynamic range emcompassing R bits, when R is an integer greater than N, comprising:

an N bit successive approximation register having a data input and N parallel data outputs, of which parallel data outputs one is a most significant bit parallel data output, of which parallel data outputs another is a least significant bit parallel data output, and of which parallel data outputs still another is an intermediate significant bit parallel data output;

an analog comparator connected to the analog electrical signal and the data input of the N bit successive approximation register, the analog comparator operating in a manner that when the analog electrical signal is at least equal to a scaled reference signal, a logically high signal will appear at the data input of the successive approximation register, and a logically low signal will appear at said data input otherwise;

a digital-to-analog converter connected to all of the parallel data outputs and producing a reference signal representing data appearing at the parallel data outputs;

a scaling network responsive to a scaling signal and connected to the digital-to-analog converter and the analog comparator and operating in a manner that the reference signal is scaled in response to the scaling signal and the scaled reference signal appears at the digital converter, whereby an operating range is selected in which at least one logically high signal is present at the data input of the successive approximation register;

a clock clocking the successive approximation register at discrete regular intervals; and

a computational supervisor cooperating with the scaling network and the successive approximation register and operating in a manner that the successive approximation register operates in a first mode in which the successive approximation register registers a group of M successive bits from the most significant bit to the intermediate signif-

icant bit wherein M is an integer less than N, and further operates in a second mode in which the successive approximation registers the successive bits N-M from the intermediate significant bit to the least significant bit, whereby the computational supervisor generates such appropriate scaling signals as to cause the successive approximation register to operate in the first and in the second mode for an integral number of cycles at most equal to C, which number C is so chosen that $(C \times M + N - M)$ will be equal to R, and repeatedly operates in the first mode until at least one of the parallel data outputs between the most significant bit and the intermediate significant bit is logically high, and subsequent to such first mode operation operates in said second mode between the intermediate significant bit to the least significant bit, such generation of appropriate scaling signals being so chosen that when all outputs appearing at the parallel data outputs are placed in that sequence in which they have been registered, and in which sequence a first bit registered is a first element in the sequence, a digital data word will be formed which corresponds to the analog electrical signal within a predetermined tolerance with an accuracy of at least N-M bits.

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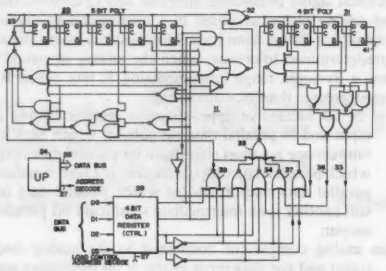
## 4,314,236
## APPARATUS FOR PRODUCING A PLURALITY OF AUDIO SOUND EFFECTS

**Steven T. Mayer, Auburn, and Ronald E. Milner, Grass Vally, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.**

**Continuation of Ser. No. 758,713, Jan. 12, 1977, abandoned. This application Jan. 24, 1979, Ser. No. 6,048**

**Int. Cl.³ G08B *3/00***

**U.S. Cl. 340—384 E** **7 Claims**




1. An apparatus for selectively producing any one of a plurality of predetermined sound effects each specified by an associated digital command character, said apparatus comprising:

variable clock means for generating a binary clock signal having a frequency specified by an associated digital command character, said clock means including an input terminal adapted to be coupled to a source of timing signals, an output terminal for manifesting said binary clock signal, a data input terminal adapted to be coupled to said associated digital command character, and means coupled to said input terminal, said output terminal and said data input terminal for transforming said timing signals to said binary clock signals; and

sound generator means for generating sound effect signals corresponding to said associated digital command character, said sound generator means including an input terminal coupled to said output terminal of said variable clock means, an output terminal for manifesting the electrical analog signals corresponding to said desired sound effect, counter means coupled to said input terminal and said output terminal for generating a binary signal train in response to the receipt of said binary clock signal, said binary signal train having a frequency content specified by said digital command character, and means coupled to said counter means for converting said binary signal train to said electrical analog signals corresponding to said desired sound effect, said converting means including means for providing a predetermined amplitude attenuation characteristic corresponding to said desired sound effect specified by said digital command character.

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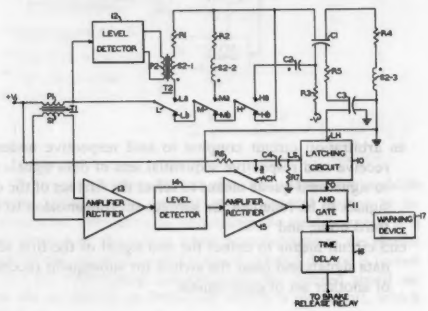
## 4,314,237
## FAIL-SAFE ACKNOWLEDGING CIRCUIT

**John O. G. Darrow, Murrysville, Pa., assignor to American Standard Inc., Swissvale, Pa.**

**Filed May 27, 1980, Ser. No. 153,493**

**Int. Cl.³ B61L *15/00, 3/00*; G08B *23/00***

**U.S. Cl. 340—502** **13 Claims**




1. A fail-safe acknowledging circuit for requiring the acknowledgment of the receipt of a more restrictive signal comprising,

(a) a plurality of signal command switches having a predetermined order of more restrictive significance,

(b) a differentiating circuit selectively interconnectable by at least one of said plurality of signal command switches for establishing a selected one of a plurality of charging levels dependent upon the electrical condition of said plurality of signal command switches,

(c) a latching circuit having a Hold input connectable to said differentiating circuit and having a set input connectable to an acknowledging means, said latching circuit having an output,

(d) an AND circuit having one of two inputs connected to said output of said latching circuit,

(e) a checking circuit connected to the other of said two inputs for verifying the absence of an unsafe condition, and said AND circuit producing an output signal when said latching circuit provides a signal to said one of said two inputs and said checking circuit provides a signal to said other of said two inputs.

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## 4,314,238
## ELECTRIC LIGHTING INSTALLATION

**Willy Rombaut, Ninove, Belgium, assignor to Gestinvest, Brussels, Belgium**

**Filed Jan. 10, 1980, Ser. No. 110,816**

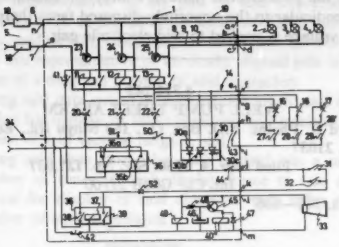
**Claims priority, application Belgium, Jan. 10, 1979, 192823**

**Int. Cl.³ G08B *25/00***

**U.S. Cl. 340—525** **21 Claims**

1. Electric lighting installation for buildings with a supply circuit for light points a part of which at least are operated through a low-voltage circuit, which is provided in substantially every room of the concerned building, with local switches for the various light points, in which there is provided at least one central control panel with for each light point or

light point group, an auxiliary switch which is connected in a parallel circuit with the corresponding local switch, and for



each light point or light point group, a corresponding indicator, such as an indicator lamp.

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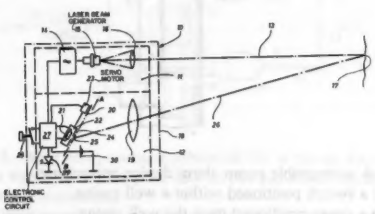
4,314,239

## PORTABLE ELECTRONIC ALARM DEVICE

Giovanni Odone, chemin du Bochet, 56, CH 1025 Saint-Sulpice, Vaud, and Willy Buchs, chemin Montaux, CH 1027 Lonay, Vaud, both of Switzerland

Filed Dec. 13, 1979, Ser. No. 103,406
Int. Cl.³ G08B *13/18*
U.S. Cl. 340—556 15 Claims




1. Apparatus for detecting and signalling intrusions, comprising in a common housing (10):

means (14,15,16) for transmitting in a selected direction at least one compact beam (13) of radiation pulses; at least one convergent optical element (19) which receives part of the radiation transmitted in said beam (13) and reflected from a surface (17) on which the beam impinges, positioned for concentrating said received radiation to form an image of said surface, the position of said image relative to said optical element (19) being dependent upon the distance of the surface (17) from the apparatus; movable detector means (21,24,25), comprising at least one photodetector (21), movable relatively to said image position and sensitive to said image position relatively to its own position, for furnishing, during a starting phase of the apparatus, a stop signal when their positions have a predetermined relationship and for furnishing during a duty phase a signal representative of an intrusion when said relationship is broken; means for moving said detector means until receipt of said stop signal; at least one electronic device (27) for processing the signals supplied by the photodetector (21) and therefor for furnishing said stop signal and said alarm signal and for transmitting it to one, or more, alarm means and also for controlling the radiation transmitter (15); a switch 28, connected with the electronic device (27) for controlling movement of said detector means;

a means, controlled by said stop signal, for indicating that said movable detector means is in the required position; the whole being arranged in such a way that, during the starting phase and therefore in absence of the intruder, either the movable detector means (21,23,24,25) or said image position can be displaced till the predetermined relationship is achieved, whereat the signals supplied by said photodetector (21) have a predetermined relationship to predetermined threshold signals and in such a way that when an intruder intercepts the beam the consequent change of the image position of the surface impinged on by the beam (13), which at this time is on the intruder, causes a sensibly extreme variation of signals supplied by the photodetector (21) so that this abrupt variation suitably processed by said electronic device (27), gives rise to a signal representative of the intrusion.

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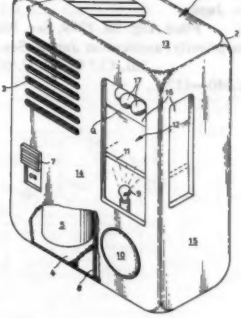
4,314,240

## DEVICE FOR LOCATING PERSONS

Manfred Schnüg, 8986 Mittelberg, Kleinwalsertal, Fed. Rep. of Germany

Filed Jan. 3, 1980, Ser. No. 109,235
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1979, 7900927[U]
Int. Cl.³ G08B *25/00*
U.S. Cl. 340—573 9 Claims



1. Apparatus for locating a person covered by snow or the like comprising a portable housing adapted for being carried by a person, a radio transmitter in said housing, and means in said housing for optically indicating the orientation of the housing with respect to the vertical.

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4,314,241

## COAL PIPE MONITOR

Donald W. La Plante, Randolph; Arthur Fairchild, Wayne, and Eugene L. Rebucci, Mountain Lakes, all of N.J., assignors to Merrick Scale Mfg. Company, Passaic, N.J.

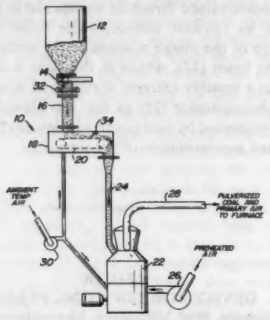
Filed Jan. 28, 1980, Ser. No. 116,325
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—603 24 Claims

1. Apparatus for monitoring the flow of coal from a coal bunker through a conduit to a feeder which delivers the coal to a pulverizer, comprising:

means for detecting the amount of coal present at a conduit zone between the bunker and the feeder and for generating a pulse signal indicative thereof,

means responsive to said pulse signal for determining

whether the amount of coal passing through said conduit zone during a discrete interval of time is not more than a




first preselected value and for generating a partial flow condition signal indicative thereof.

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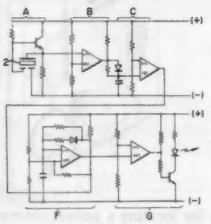
**4,314,242**

## APPARATUS FOR DETECTING A RESIDUAL QUANTITY OF TONER

**Hiroshi Kuru; Mitsuo Akiyama, and Isao Ikemoto, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed Aug. 30, 1979, Ser. No. 71,039**
**Claims priority, application Japan, Sep. 8, 1978, 53-110535**
**Int. Cl.³ G08B *21/00***
**U.S. Cl. 340—617** **6 Claims**




1. Apparatus for detecting a residual quantity of a toner material in the toner supply hopper of an electrophotographic copying apparatus, the toner supply hopper including at least a wall in contact with toner material in the hopper, said apparatus comprising:

a vibrating element disposed in and forming an integral portion of the wall of the toner supply hopper so that one surface of the vibrating element is normally positioned in contact with toner material contained in the hopper; and

electronic circuit means connected with said vibrating element for effecting vibration thereof at a predetermined frequency and for detecting a change in the operating characteristics of said element, said circuit means further including warning means for indicating said change so as to signal a decrease in the amount of toner material in the supply hopper;

said vibrating element comprising a piezoelectric plate integrally disposed in the wall of the toner supply hopper, and electrodes on oppositely-disposed faces of said piezoelectric plate such that at least one of the electrodes is normally disposed in contact with toner material contained in the supply hopper, said electronic circuit means being connected to the vibrating element at said electrodes, and said vibrating element further comprising a pair of electrodes on one face of said piezoelectric plate and a single electrode on the opposite face of said plate, said electronic circuit means causing a voltage to be applied to said pair of electrodes and said single electrode enabling vibration of the piezoelectric plate in a direction substantially perpendicular to the oppositely-disposed faces thereof when a voltage is applied to said electrode pair.

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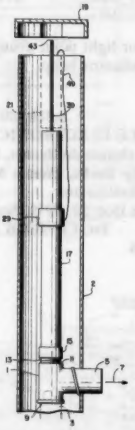
**4,314,243**

## WELL PUMP THEFT ALARM

**Clifford R. Phelps, P.O. Box 117, 183 Mayo Rd., Edgewater, Md. 21037**

**Filed Mar. 4, 1980, Ser. No. 127,037**
**Int. Cl.³ G08B *21/00***
**U.S. Cl. 340—686** **8 Claims**




1. A submersible pump alarm device comprising:

(a) a switch positioned within a well casing,

(b) a cover positioned over the well casing,

(c) an adapter connected to well pipe in the casing,

(d) an extension connected to said adapter,

(e) said switch being positioned in said extension, and

(f) means for actuating said switch when said cover is removed, including an actuator on said switch and means cooperating with said actuator and said cover.

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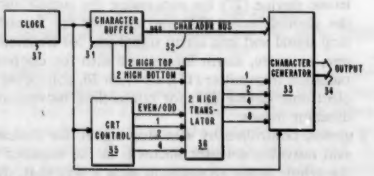
**4,314,244**

## MULTIPLE HEIGHT PROPORTIONED CHARACTER GENERATION

**Kent R. Demke, Austin; Jerold D. Dwire, Round Rock; Michael A. Ko, and Joanne L. Mumola, both of Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 16, 1980, Ser. No. 159,558**
**Int. Cl.³ G06F *3/153***
**U.S. Cl. 340—731** **10 Claims**




1. A method of generating alphanumeric characters and

symbols in a number of different vertical heights on a display device, comprising:

storing in a memory at separate addresses associated with said characters and symbols, a plurality of bits of video data representative of the pels of said characters and symbols to be displayed in the smallest of said number of sizes, said storing being limited to include no more than two bits representative of vertically aligned pels in a segment of a diagonal portion of said character;

applying said data stored by each of said bits to said display device for display of said characters and symbols in the lowest of said vertical heights; and

applying said data stored by each of said bits a multiple number of times in each display frame to said display device for display of said character in a taller of said number of vertical heights.

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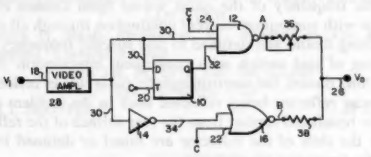
## 4,314,245
## VIDEO COMPENSATION SUBCIRCUIT

John R. Wilbur, Jr., 1466 Portobelo Dr., San Jose, Calif. 95118

Filed Mar. 10, 1980, Ser. No. 129,084
Int. Cl.³ G06F *3/14*
U.S. Cl. 340—812 7 Claims




1. A video compensation subcircuit for a circuit having a video signal, a clock signal, and an inverse clock signal, the subcircuit comprising

multivibrator means coupled to said video signal and responsive to said clock signal, and operative to develop a delay signal,

NAND gate means coupled to said video signal and responsive to said delay signal and said inverse clock signal, and operative to develop a subtraction signal,

inverter means responsive to said video signal and operative to develop an inverse video signal,

NOR gate means coupled to said inverse video signal and responsive to said clock signal, and operative to develop a pulsed video signal, and

adder means for adding at least a portion of said subtraction signal and at least a portion of said pulsed video signal to produce an output video signal.

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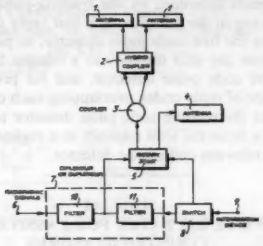
## 4,314,246
## DEVICE FOR TRANSMITTING RADIOPHONIC SIGNALS IN SECONDARY RADAR EQUIPMENT

Jacques Cherier; Albert Dupressoir, and Olivier Aubergeon, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 6, 1980, Ser. No. 147,294
Claims priority, application France, May 8, 1979, 79 11630
Int. Cl.³ G01S *13/78, 13/87*
U.S. Cl. 343—6 R 5 Claims

1. A device for transmitting radiophonic signals and signals from an interrogation device known under the abbreviation IFF of a secondary radar comprising a non-directional antenna and a directional antenna, wherein the antenna for transmitting



radiophonic signals is the non-directional antenna of the interrogation device.

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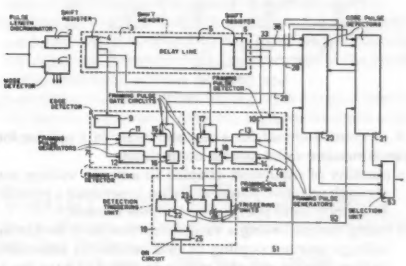
## 4,314,247
## DEGARBLER FOR AN INTERROGATOR-TRANSPONDER SYSTEM

Bernard H. M. Oude Elberink, Oldenzaal; Gerardus J. M. Damhuis, Rossum, and Han Alink, Hengevelde, all of Netherlands, assignors to Hollandse Signaalapparaten B.V., New York, N.Y.

Filed Apr. 13, 1979, Ser. No. 30,041
Claims priority, application Netherlands, Apr. 26, 1978, 7804440
Int. Cl.³ G01S *13/78*
U.S. Cl. 343—6.5 LC 7 Claims




1. Degarbler for use in an interrogator-transponder system with a reply code which consists of first and second framing pulses, separated by a fixed time interval, and between said two framing pulses a reply, representative of the presence or absence of code pulses in defined time slots, the degarbler comprising in combination:

a shift memory for the storage of the reply code;

a first and a second framing-pulse detector, which two detectors are connected to output taps of the shift memory, which output taps show a time difference greater that said fixed time interval, said first and second framing-pulse detectors comprising means for generating gate pulses responsive to leading and trailing edges of said second and first framing pulses, respectively, said first framing pulse detector responsive to a condition wherein at least one of the edges of the first framing pulse falls within gates generated with the second framing pulse for producing a signal indicating the presence of a first reply code in the shift memory, said second framing pulse detector responsive to a condition wherein at least one of the edges of the second framing pulse falls within gates generated with the first framing pulse for providing a signal indicating the presence of a reply code overlapping a preceding reply code in the shift memory;

a detection triggering unit; and

a first and second code pulse detector, the detection triggering unit comprising means operative in response to at least the signals delivered by the framing-pulse detectors for producing in the presence of a first reply code a series of gates in the first code pulse detector, to pass through the data from the shift memory to a register forming part of the first code pulse detector, and for producing in the presence of reply codes overlapping each other a series of gates in the relative code pulse detector to pass through the data from the shift memory to a register forming part of the relevant code pulse detector.

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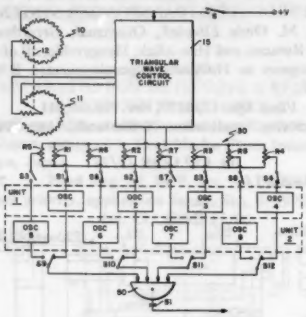
**4,314,248**

## DECEPTIVE REPEATER FOR PASSIVE LOBING COUNTERMEASURES

**Jerome V. White, Amherst, N.H., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Sep. 17, 1969, Ser. No. 862,631**
**Int. Cl.³ G01S *7/38***
**U.S. Cl. 343—18 E** **8 Claims**




1. A control circuit for a repeater radar in a passive lobing countermeasure radar system comprising:

a plurality of oscillators coupled to a single voltage source through selective power switches to produce a plurality of frequency band portions on outputs thereof;

a timing circuit having a variable current flow device in the voltage source coupling of said oscillators between said voltage source and said power switches to vary the voltage from minimum to maximum and return thereby varying the time it takes each oscillator to sweep its frequency portion; and

an AND circuit coupled to the outputs of all selected oscillators to mix the output frequency band portions into a complex wave and to pass an output signal when said complex wave drops below the average values of oscillator outputs whereby said output signal is usable to activate a repeater countermeasure radar.

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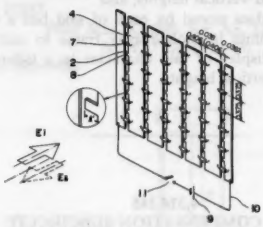
**4,314,249**

## RADAR REFLECTOR WITH VARIABLE ELECTRIC REFLECTIVITY

**Morio Onoe, 4-9-7 Taishido, Setagaya-ku, Tokyo, Japan**

**Filed Jul. 11, 1980, Ser. No. 167,783**
**Claims priority, application Japan, Jul. 11, 1979, 54/88520**
**Int. Cl.³ H01Q *15/00***
**U.S. Cl. 343—18 D** **3 Claims**

1. A radar reflector adapted for retransmission of response information to a radar station upon reception of electromagnetic radar waves therefrom, said reflector comprising a plurality of metallic reflector plates arranged in parallel and in a side-by-side relation to one another, said plates each being integrally formed with bosses at fixed intervals projecting towards an adjoining one of said reflector plates, each of said bosses defining with said adjoining one of said reflector plates a gap adapted for isolating the associated plates from each other with respect to direct current and connecting said associated plates to each other with respect to the high frequency of the electromagnetic radar waves, a plurality of switching diodes electrically connected between adjoining ones of said reflector plates and intermediate adjoining ones of said bosses associated with the same two plates, a bias source, a switch connected in series with said source, and conductor means connected to said series circuit of said source and switch and to



two of said plates, the size of each slot defined by two adjoining ones of said bosses associated with two adjoining plates and by said two adjoining plates being selected to be tuned to the specific frequency of the radar waves upon closure of said switch with consequent current conduction through all of said switching diodes and detuned to said specific frequency upon opening of said switch with consequent interruption of said switching diodes, the electromagnetic radar waves incident on the radar reflector being reflected back in the incident direction or reradiated further from the rear surface of the reflector when the slots of the reflector are tuned or detuned to said specific frequency respectively.

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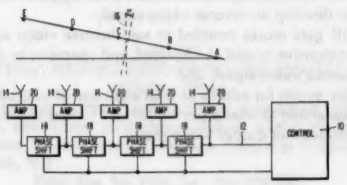
**4,314,250**

## INTERMODULATION PRODUCT SUPPRESSION BY ANTENNA PROCESSING

**Sigmund H. Hanell, Vernouillet, France, and Randall W. Kreutel, Jr., Rockville, Md., assignors to Communications Satellite Corporation, Washington, D.C.**

**Filed Aug. 3, 1979, Ser. No. 63,887**
**Int. Cl.³ H01Q *3/36***
**U.S. Cl. 343—100 SA** **7 Claims**




1. In a method of fabricating an active phased-array, multiple-beam antenna for radiating a plurality of N desired beams from a plurality of N carriers, each of said desired beams having a carrier frequency $w_n$, $1 \leqq n \leqq N$, said method including the steps of connecting said plurality of radiating elements to the output terminals of respective non-linear amplifiers with an inter-element spacing of $d_x$ in an x direction and $d_y$ in a y direction and connecting to said nonlinear amplifiers a means for generating a phase tilt of said carriers across said array of spaced radiating elements, said phase tilt having a value $\alpha_x$ in said x direction and $\alpha_y$ in said y direction, the improvement comprising:

determining, for each carrier frequency $w_n$, all possible

permutations of $k_1, k_2, \ldots, k_N$ for which $w_I = w_n$, where $w_I$ is an intermodulation product frequency given by

$$w_I = k_1w_1 + k_2w_2 + \ldots + k_Nw_N$$

and $k_1, k_2, \ldots, k_N$ are constants which can be any positive or negative integer or 0 subject to the constraint

$$k_1 + k_2 + \ldots k_N = 1;$$

inserting said determined permutations into the equation

$$\theta_{xi} = k_1\theta_{x1} + k_2\theta_{x2} + \ldots + k_N\theta_{xN}$$

$$\theta_{yi} = k_1\theta_{y1} + k_2\theta_{y2} + \ldots + k_N\theta_{yN}$$

to determine the pointing direction $(\theta_{xi}, \theta_{yi})$ of each intermodulation product beam having a carrier frequency $w_I = w_n$, where $(\theta_{xn}, \theta_{yn})$ is the pointing direction of a desired beam having a carrier frequency $w_n$; and

adjusting the pointing directions $(\theta_{xn}, \theta_{yn})$ of the desired beams such that the pointing directions $(\theta_{xi}, \theta_{yi})$ of each intermodulation product beam for which $w_I = w_n$ will differ from the pointing direction $(\theta_{xn}, \theta_{yn})$ of the desired beam having that same carrier frequency $w_n$.

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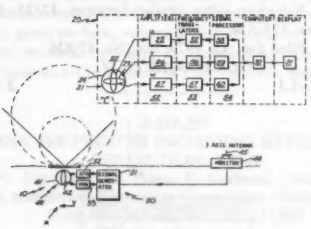
**4,314,251**

## REMOTE OBJECT POSITION AND ORIENTATION LOCATER

**Frederick H. Raab, Burlington, Vt., assignor to The Austin Company, Cleveland, Ohio**

**Filed Jul. 30, 1979, Ser. No. 62,140**
**Int. Cl.³ G01S 5/02**
**U.S. Cl. 343—112 R** **31 Claims**



1. Apparatus for determining the position and orientation of a remote object relative to a reference coordinate frame comprising:

a plurality of radiating means having orthogonal components centered about the origin of said reference coordinate frame;

transmitter means for applying to said plurality of radiating means electrical signals which generate a plurality of electromagnetic fields, said plurality of electromagnetic fields being distinguishable from one another;

a plurality of receiving means having orthogonal components disposed on said remote object for detecting and measuring said electromagnetic fields:

one of said plurality of radiating means and said plurality of receiving means consisting of two orthogonal components and the other consisting of three orthogonal components; and

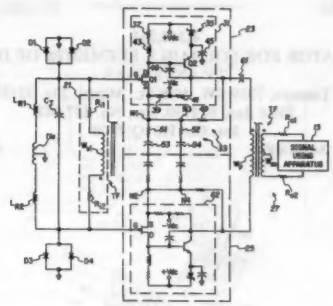
analyzing means associated with said receiving means for converting the components of said electromagnetic fields received by said plurality of receiving means into remote object position and orientation relative to said reference coordinate frame with at most two ambiguous combinations of orientation and position, said analyzing means operating open loop with respect to said radiating means.

**4,314,252**

## PREAMPLIFIER FOR ADF LOOP ANTENNA

**Thomas W. Burrus, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Nov. 14, 1980, Ser. No. 206,763**
**Int. Cl.³ G01S 5/02**
**U.S. Cl. 343—113 R** **15 Claims**



1. For use with an automatic direction finder, an antenna and preamplifier system comprising:

(i) two loop antenna windings,

(ii) two substantially matched gain preamplifiers, each being associated with a different one of said antenna windings, each preamplifier comprising:

(a) an input impedance establishing network having input means connected for receiving excitation from opposite ends of the preamplifier-associated antenna winding,

(b) a pair of negative feedback amplifiers for operating in push-pull relationship and having input means connected for receiving excitation from opposite ends of the preamplifier-associated antenna winding, and

(c) an output receiving means having input means connected for receiving excitation from the negative feedback amplifier pair.

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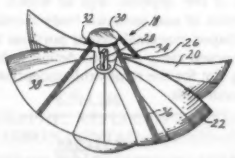
**4,314,253**

## PORTABLE FOLDING MICROWAVE ANTENNA

**Michael G. Sayovitz, Sunland, Calif., assignor to Compact Video Sales, Inc., Burbank, Calif.**

**Filed Apr. 11, 1980, Ser. No. 139,258**
**Int. Cl.³ H01Q 3/02, 15/20**
**U.S. Cl. 343—765** **7 Claims**



1. A portable dish antenna comprising: a base, a pedestal supported on the base, a folding circular reflector means including first and second semicircular sections having mating straight sides, mating parabolic reflecting surfaces, and hinge means joining the sections along a hinge axis parallel to the straight sides of the semicircular sections, means mounting the hinge means on top of the pedestal with the hinge axis extending substantially perpendicular to the pedestal, the hinge axis being offset from the semicircular sections by an amount slightly greater than half the width of the pedestal, means rotating the semicircular sections about the hinge axis in oppo-

site directions to move the members between a folded position and an extended position, said sections in the folded position hanging downwardly from the hinge axis on either side of the pedestal and in the extended position forming a circular reflector, means locking the two semicircular sections together in the extended position, and means rotating the locked together sections as a unit about said hinge axis to change the elevation angle of the antenna.

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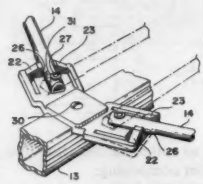
**4,314,254**

## INSULATOR FOR FOLDABLE ELEMENTS OF DIPOLE TV ANTENNAS

**Abel C. Tamayo, 7339 SW. 45th St., Miami, Fla. 33155**

**Filed Jun. 6, 1980, Ser. No. 157,042**
**Int. Cl.³ H01Q *1/08***
**U.S. Cl. 343—809** **5 Claims**




1. A dipole element insulator comprising, in combination, a body member integrally molded of a substantially rigid, yet somewhat resilient, synthetic plastic material, said body member having a central portion and opposed, symmetrically-arranged, outwardly-extending arm portions, means for supporting said central portion of said body member to a TV antenna support boom in transverse relation with respect thereto so that said opposed arm portions extend laterally outwardly of the boom in opposite directions, means for pivotally and swingingly supporting inner end portions of a pair of tubular dipole element rods, one each, against said opposed side arm portions of said insulator body member, whereby, when said insulator is so supported with respect to a supporting boom, said element rods can be pivotally swung between a first position whereat they lie close along the boom, and a second position whereat they will be in opposed, outstretched relation with respect to the boom, and detent means integrally formed along outer marginal portions of said insulator body arm portions for removably locking the dipole element rods in said second position wherein said integrally formed detent means comprises a U-shaped through slot in each of said insulator body arm portions, said U-shaped slots defining respective U-shaped, outwardly extending, marginal detent portions the outer ends of the opposed legs of which connect with said central portion of said insulator body member, the outer ends of said U-shaped marginal detent portions being formed with laterally opposed ramp portions defining therebetween a central locking slot for the removable reception, one each, of said dipole element rods.

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**4,314,255**

## ELECTROMAGNETIC ANGLE FILTER INCLUDING TWO STAGGERED, IDENTICAL, PERIODICALLY PERFORATED CONDUCTIVE PLATES

**Thomas W. Kornbau, Poway, Calif., assignor to General Dynamics, Electronics Division, San Diego, Calif.**

**Filed Apr. 8, 1980, Ser. No. 138,324**
**Int. Cl.³ H01Q *15/10***
**U.S. Cl. 343—909** **4 Claims**

1. An angle filter for electromagnetic radiation having a predetermined wavelength λ, comprising:

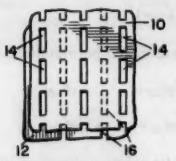
a planar-parallel pair of perforated conductive plates having arrays of periodic perforations;

characterized by

all of the perforations in both plates being identical;

the spacing between the perforations in both plates being identical;

the perforations being spaced apart for creating grating lobes between the plates at the predetermined wavelength λ at incidence angles greater than $\theta_G$; and




the plates being staggered so that the perforations in at least one dimension of one plate are aligned between the perforations in the corresponding dimension of the other plate for minimizing coupling between the plates at incidence angles somewhat greater than $\theta_G$ in a plan corresponding to the one dimension.

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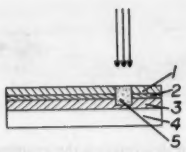
**4,314,256**

## RADIATION-SENSITIVE MATERIAL AND METHOD FOR RECORDING INFORMATION ON RADIATION-SENSITIVE MATERIAL

**Vyacheslav V. Petrov, prospekt Vernadskogo, 85, kv. 55, and Andrei A. Krjuchin, ulitsa Studencheskaya, 12/14, kv. 43, both of Kiev, U.S.S.R.**

**Filed Jun. 12, 1979, Ser. No. 47,924**
**Int. Cl.³ G01D *15/34***
**U.S. Cl. 346—1.1** **2 Claims**

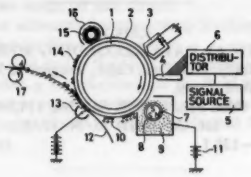



1. A method for recording information on a radiation-sensitive material comprising a metallic layer made of a metal selected from the group consisting of silver, copper, nickel, thallium and their alloys, an inorganic material layer made of material selected from the group consisting of arsenic chalcogenide, antimony chalcogenide, and bismuth chalcogenide, and a separation layer disposed between said metallic layer and said inorganic material layer and made from a material being inert relative to said metallic layer and said inorganic material layer, said separation layer having a thickness of from 50 to 300 Å and made of a material selected from the group consisting of As, Sb, Si, Ge, and their oxides, and oxides of Al, Ti, V, Fe, and polyorganosiloxane films, said method comprising irradiation of the radiation-sensitive material by pulses of actinic radiation of a duration from $10^{-6}$ to $10^{-8}$ s with an energy density in the area exposed to radiation being not less than $5.10^{-2}$ J/cm$^2$, said pulses being capable of producing in the exposed area of the radiation-sensitive material a potential difference between said metallic layer and said inorganic material layer so as to cause an electric breakdown of said separation layer in said area.

## 4,314,257
## THERMOMAGNETIC RECORDING APPARATUS

Kazuyoshi Tokunaga; Masayasu Anzai; Nobuyoshi Hoshi, and Kiyohiko Tanno, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 3, 1980, Ser. No. 126,694
Claims priority, application Japan, Mar. 16, 1979, 54-29907
Int. Cl.³ G11B *11/10*
U.S. Cl. 346—74.4 8 Claims




1. In a thermomagnetic recording apparatus having a magnetic recording medium which is uniformly coated with a magnetic material, magnetizing means to magnetize the magnetic material, a thermal recording head which is placed in adjacency to the magnetic recording medium, means to subject the magnetic recording medium to development so as to obtain a developed image, means to transfer the developed image from the recording medium onto a transfer medium, means to fix the transferred image onto the transfer medium, and means to sweep away developer powder remaining on the recording medium after the development as well as the transfer; a thermomagnetic recording facsimile receiver characterized in that said thermal recording head comprises a large number of heating recording elements which are arrayed over substantially a full width of a recording region of said magnetic material, and that selected ones of said heating recording elements are energized to generate heat, whereby picture element areas of said magnetic material opposing to the selected elements can be heated near to a Curie point of said magnetic material.

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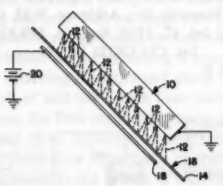
## 4,314,258
## INK JET PRINTER INCLUDING EXTERNAL DEFLECTION FIELD

John W. Donahue, and James F. Gottman, both of Dayton, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Feb. 4, 1980, Ser. No. 117,909
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 20 Claims



1. An ink jet printer for depositing drops at print positions on the surface of a print receiving medium, comprising:

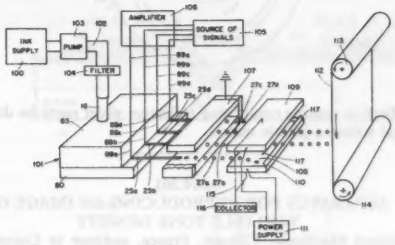
print head means for generating a plurality of jet drop streams directed toward said print receiving medium, each drop in said jet drop streams being charged to one of a plurality of charge levels, and

deflection means for generating a static electrical deflection field extending through said print receiving medium in a direction nonparallel to said plurality of jet drop streams for deflecting charged drops in said streams to print positions on said print receiving medium.

## 4,314,259
## APPARATUS FOR PROVIDING AN ARRAY OF FINE LIQUID DROPLETS PARTICULARLY SUITED FOR INK-JET PRINTING

Walter J. Cairns, Marblehead, and Curtis P. Van Vloten, Cambridge, both of Pa., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Jun. 16, 1980, Ser. No. 159,799
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 32 Claims




1. An apparatus for providing an array of fine liquid streams which break up at drop formation points to form streams of liquid droplets, comprising the combination

(a) base plate means having a plurality of grooves spaced according to a predetermined pattern in at least one contacting/sealing surface thereof;

(b) cover plate means engageable with said at least one contacting/sealing surface of said base plate means to form with said grooves a plurality of nozzles extending along at least a portion of the length of said grooves wherein said base plate means and said cover plate means are maintained in liquid sealing contact and said base plate means and said grooves therein extend beyond the discharge end of said nozzles to provide groove extensions;

(c) liquid manifold means communicating with said grooves to supply liquid under pressure to said nozzles; and

(d) separate electrode means associated with each liquid stream arranged to contact said liquid stream in said groove extension.

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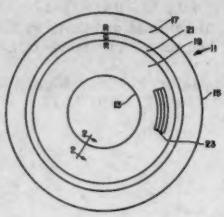
## 4,314,260
## LASER PYROGRAPHIC REFLECTIVE RECORDING LAYER IN A CARBON CONTAINING ABSORPTIVE MATRIX

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 60,913, Jul. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 12,235, Feb. 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 921,723, Aug. 17, 1978, abandoned. This application Mar. 18, 1980, Ser. No. 131,288
The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.
Int. Cl.³ G01D *15/10, 15/34*
U.S. Cl. 346—76 L 36 Claims

1. An information storage medium for pyrographically re-

cording laser writing comprising a reflective surface coating of at least 15% reflectivity disposed on a sheet substrate, the



reflective coating comprising reflective silver particles distributed within a gelatin matrix.

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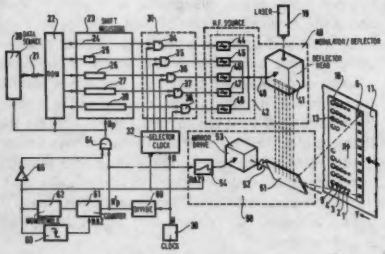
**4,314,261**

## APPARATUS FOR REPRODUCING AN IMAGE OF VARIABLE TONE DENSITY

**Bernard Martinage, Clamart, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France**

**Filed Aug. 4, 1980, Ser. No. 175,221**
**Claims priority, application France, Aug. 14, 1979, 79 20658**
**Int. Cl.³ H04N *1/22***
**U.S. Cl. 346—108** **3 Claims**



1. Apparatus for reproducing an image on a photo-sensitive medium, the image being defined by binary data representative of different tone levels of pixels defined as elementary points constituting the image, the apparatus comprising:

a source of light providing a beam for printing the pixels;

means for moving the beam over the medium in an X direction to scan the pixels of an image line;

means for moving the medium in a Y direction substantially perpendicular to the X direction to scan the pixels of different image lines;

a screen located close to the said medium on the path of the beam, said screen being opaque to said beam and including n rows of diaphragms that are transparent to the beam and are arranged in N columns extending substantially parallel to the Y direction, for an image having N pixels per image line, with each one of the n diaphragms of any given column being of a different size from the others in said column to define different half tone dot sizes, the diaphragms of each row being disposed at the spacing of pixels along an image line, and the rows of diaphragms being disposed at a spacing of m times the spacing of the image lines, where m is an integer equal to unity or a small number;

conversion means for converting said data into binary words, each representative of the rank r of the diaphragm to be used to define the tone of each pixel, where the rank r of a diaphragm is its position in the Y direction along its column counting from the first row of diaphragms encountered by the moving medium, and where $1<r<n$;

processing means for processing said binary words delivered by said conversion means to apply shifts corresponding to the time taken by the medium to move $m(r-1)$ image lines relative to the screen;

and means for deflecting said beam under the control of said processing means to direct the said beam onto those diaphragms of each column whose respective ranks are indicated by said words as delivered by said processing means.

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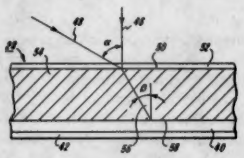
**4,314,262**

## OPTICAL DATA RECORDING MEDIUM

**Charles M. Reilly, Pasadena, Calif., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Feb. 4, 1980, Ser. No. 118,345**
**Int. Cl.³ G01D *15/34, 15/10***
**U.S. Cl. 346—135.1** **7 Claims**



1. An optical recording medium optimized to yield maximum absorption of recording optical radiation incident on a metal layer portion of said recording medium, the radiation being incident over a relatively wide range of angles comprising:

a substrate interposed in the path of said incident optical radiation, said substrate being transparent to said incident radiation incident on one surface thereof;

a dielectric coating overlying the other surface of said substrate, said coating being transparent to said radiation and providing a high contrast ratio for reflectivity, the thickness of said dielectric coating being determined by a weighting factor, said weighting factor being a function of the incident angle of the incident radiation; and

a metal layer overlying said dielectric coating, said metal layer being responsive to that portion of the radiation incident thereon.

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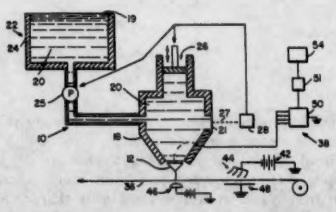
**4,314,263**

## FLUID JET APPARATUS

**Adam L. Carley, Westside Dr., Atkinson, N.H. 03811**

**Filed Jul. 17, 1980, Ser. No. 169,815**
**Int. Cl.³ G01D *15/18***
**U.S. Cl. 346—140 R** **149 Claims**



1. Fluid jet apparatus comprising:

(a) nozzle means having a nib at its downstream tip;

(b) fluid supply means in communication with said nozzle means for supplying fluid to said nozzle means;

(c) means for regulating fluid pressure conditions in the fluid at said nozzle means such that substantially no fluid flows from said nozzle nib in the absence of the action of supplemental flow causing means;
(d) a target spaced from said nozzle means;
(e) means for producing a field in the region between said nozzle means and said target to initially accelerate the fluid from said nozzle nib and to cause the fluid to thereafter flow in filament-like form to said target, said fluid forming an image on said target;
(f) means for substantially suppressing breakup into droplets of the filament-like fluid flow;
(g) means acting on the fluid before it leaves said nozzle nib for modulating the amplitude of the fluid flow; and
(h) information signal reception means for controlling said modulating means to produce the desired fluid image on said target.

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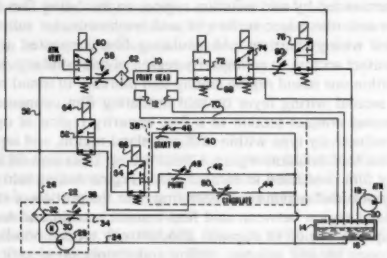
**4,314,264**

## INK SUPPLY SYSTEM FOR AN INK JET PRINTER

**Dennis E. Bok; Mark E. Brown, both of Dayton; Steven R. Hahn, Centerville; David A. Huliba, Kettering, and Thomas M. Wysinski, Dayton, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio**

**Filed Aug. 15, 1980, Ser. No. 178,325**
**Int. Cl.³ G01D *15/18***
**U.S. Cl. 346—140 R** **19 Claims**



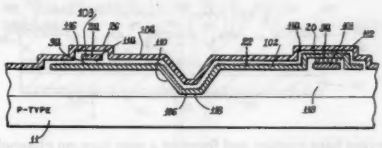
1. An ink supply system for supplying ink to the print head of an ink jet printer for production of jet drop streams, comprising
an ink supply tank for storing a quantity of ink,
pump means, having a pump inlet and a pump outlet, for receiving ink from said ink supply tank at said pump inlet and for providing ink under pressure at said pump outlet,
ink recirculation means including a plurality of ink return lines for returning ink from said pump outlet to said pump inlet, each of said ink return lines including flow restriction means, the flow restriction means in each line providing a fluid flow impedance therethrough which differs from the fluid flow impedance provided by the flow restriction means in the others of said ink return lines,
controllable valve means for selectively directing ink from said pump means to a selected one of said ink return lines,
print head supply line means for providing flow of ink from said pump means to said print head, and
solenoid means for controllably actuating said controllable valve means such that a portion of the ink from said pump outlet is returned to said pump inlet through a selected one of said ink return lines while the remainder of the ink from said pump means is supplied to said print head through said print head supply line means, whereby the fluid flow rate of ink supplied to said print head means is controlled by returning ink from said pump outlet to said pump inlet through a selected flow restriction means.

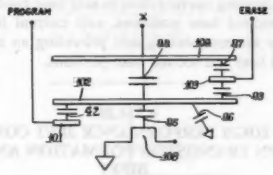
**4,314,265**

## DENSE NONVOLATILE ELECTRICALLY-ALTERABLE MEMORY DEVICES WITH FOUR LAYER ELECTRODES

**Richard T. Simko, Los Altos, Calif., assignor to Xicor, Inc., Los Altos, Calif.**

**Filed Jan. 24, 1979, Ser. No. 6,026**
**Int. Cl.³ H01L *29/78***
**U.S. Cl. 357—23** **14 Claims**




1. A nonvolatile, electrically-alterable floating gate memory device comprising:
a semiconductor substrate,
a dielectrically isolated floating gate conductor,
means for detecting electrical charge on said floating gate conductor comprising a MOS sense transistor formed in said substrate and modulated by a portion of said floating gate conductor,
means for introducing electrons onto said floating gate conductor comprising a first electrode intermediate said substrate and said floating gate conductor,
means for removing electrons from said floating gate conductor comprising a second electrode overlying said floating gate conductor such that said floating gate conductor is intermediate said substrate and said second electrode,
means for capacitively biasing said floating gate conductor comprising a bias electrode overlying said second electrode and said floating gate conductor such that said second electrode and said floating gate conductor are intermediate said bias electrode and said substrate, and
dielectric means for insulating each of said electrodes from said substrate and from adjacent electrodes.

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**4,314,266**

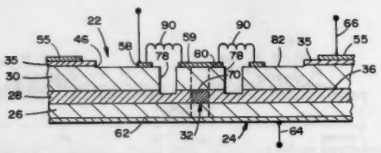
## THYRISTOR WITH VOLTAGE BREAKOVER CURRENT CONTROL SEPARATED FROM MAIN EMITTER BY CURRENT LIMIT REGION

**Victor A. K. Temple, Clifton Park, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.**

**Continuation of Ser. No. 926,564, Jul. 20, 1978, abandoned. This application Oct. 10, 1980, Ser. No. 196,098**
**Int. Cl.³ H01L *29/74***
**U.S. Cl. 357—38** **25 Claims**

1. A thyristor device for controlling current flow between a pair of terminals and which switches into forward conduction by means of a gate electrode and gate current or from a blocking mode when the terminal voltage between said terminals exceeds a breakover voltage, said thyristor device comprising:
a semiconductor body having at least four zones of alternate conductivity type extending between said terminals, including an emitter zone having a first emitter in contact with one said terminal, a base zone adjacent said emitter zone, a blocking pn junction defining the boundary between said base zone and a

third said zone adjacent said base zone, means in said body for localizing a breakover portion of said blocking pn junction where forward breakover initiates when said terminal voltage exceeds said breakover voltage, said base zone including a first base portion disposed adjacent said breakover portion of said blocking pn junction and a second base portion in contact with, said first emitter, said gate electrode being disposed on said




second base portion and forming a gate turn-on channel region for said gate current in said second base portion between said gate electrode and said emitter zone, and current limiting means for limiting current flow in said base zone between said first and second base positions, said current limiting means electrically interconnecting and providing an impedance between said first and second base portions.

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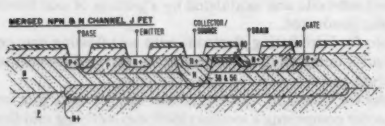
**4,314,267**

## DENSE HIGH PERFORMANCE JFET COMPATIBLE WITH NPN TRANSISTOR FORMATION AND MERGED BIFET

**David L. Bergeron, Winooski, Vt., and Geoffrey B. Stephens, Cary, N.C., assignors to IBM Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 915,337, Jun. 13, 1978, abandoned.**
**This application Feb. 4, 1980, Ser. No. 118,248**
**Int. Cl.³ H01L *27/02, 29/80, 29/72***
**U.S. Cl. 357—43** **3 Claims**




1. In an integrated circuit having a plurality of P-type regions formed in the same process step, a first subplurality of which are P-type base regions of vertical NPN transistors, a Junction Field Effect Transistor (JFET) device formed in one of a second subplurality of said plurality of P-type regions, comprising:

an insulating layer on the surface of said one P-type region having first and second windows therein;

a first N-type region in said one P-type region formed through said first window for the JFET source;

a second N-type region spaced from said first N-type region in said one P-type region formed through said second window for the JFET drain;

an ion-implanted N-type channel region in said one P-type region connected to said source and drain regions;

said one P-type region serving as the gate for the JFET device;

said one P-type region extending horizontally beyond said first N-type region, with said first N-type region extending horizontally and vertically to separate said one P-type region into first and second P-type portions which are electrically isolated from one another, said first portion being said gate for said JFET device;

a third window in said insulating layer over said second P-type portion;

a third N-type region formed through said third window, as an emitter in an NPN transistor formed with said second P-type portion as the base and said first N-type region serving as the collector thereof;

whereby a series connected JFET and NPN bipolar transistor are formed with said first N-type diffusion serving as the output node thereof.

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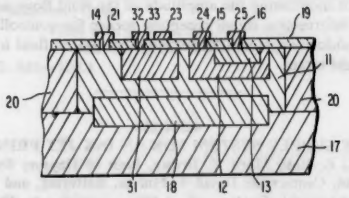
**4,314,268**

## INTEGRATED CIRCUIT WITH SHIELDED LEAD PATTERNS

**Takakazu Yoshioka, and Masayuki Kurozumi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed May 31, 1979, Ser. No. 44,140**
**Claims priority, application Japan, May 31, 1978, 53-66041**
**Int. Cl.³ H01L *27/04***
**U.S. Cl. 357—48** **6 Claims**




1. A semiconductor integrated circuit device comprising a semiconductor substrate, an isolation region, a plurality of island regions provided along one major surface of said semiconductor substrate, each said island region being substantially surrounded by said isolation region, an insulating film formed on said one major surface of said semiconductor substrate, a first wiring layer on said insulating film connected at a first contact section to an impurity region of one conductivity type within one island region among said plurality of island regions, a second wiring layer on said insulating film connected at a second contact section to a first impurity region of opposite conductivity type within said one island region, and separated from said isolation region, a third wiring layer on said insulating film connected to another island region among said plurality of island regions and extending over the portion of said one island region between said first contact section and said first impurity region of opposite conductivity type, a bonding pad formed on said isolation region and connected electrically to said third wiring layer, a second impurity region of said opposite conductivity type provided along said one major surface in the portion of said one island region under said third wiring layer and remote from said bonding pad and separated from said first impurity region of said opposite conductivity type, and a forth wiring layer on said insulating film connected to another predetermined portion of said second impurity region of said opposite conductivity type except for the portion under said third wiring layer, said second impurity region of said opposite conductivity type being held at a fixed potential through said forth wiring layer.

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**4,314,269**

## SEMICONDUCTOR RESISTOR COMPRISING A RESISTOR LAYER ALONG A SIDE SURFACE

**Kunimitsu Fujiki, Kawasaki, Japan, assignor to VLSI Technology Research Association, Kawasaki, Japan**

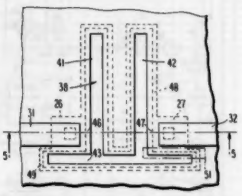
**Filed Jun. 6, 1979, Ser. No. 45,890**
**Claims priority, application Japan, Jun. 6, 1978, 53-68575**
**Int. Cl.³ H01L *27/04***
**U.S. Cl. 357—51** **10 Claims**

1. A semiconductor resistor comprising:

a semiconductor block having a predetermined conductivity type, a block principal surface, a back surface opposite to said principal surface, and meandering internal side surface contiguous to said principal and said back surfaces, said internal side surface defining a groove extending in said semiconductor block and comprising first and second predetermined areas on said internal side surface and an

intermediate area between and continuous to said first and said second areas;

a semiconductor bulk of the predetermined conductivity type having a bulk principal surface in contact with said back surface, with a portion of the bulk principal surface exposed through said groove to define a bottom of said groove, said semiconductor bulk having a substantially uniform impurity concentration at least along said bulk principal surface;




a semiconductor layer of the conductivity type opposite to said predetermined conductivity type, said semiconductor layer covering said first, said second, and said intermediate areas; and

a first and a second contact layer of the opposite conductivity type along those predetermined areas of said block principal surface which are contiguous to said first and second areas, respectively, said first and said second contact layers being electrically connected to those portions of said semiconductor layer which cover said first and said second areas, respectively.

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**4,314,270**

## HYBRID THICK FILM INTEGRATED CIRCUIT HEAT DISSIPATING AND GROUNDING ASSEMBLY

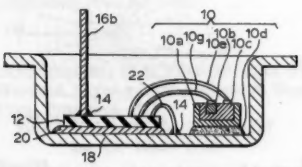
**Shiro Iwatani, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 964,439, Nov. 28, 1978, abandoned. This application Oct. 10, 1980, Ser. No. 196,093**

**Claims priority, application Japan, Dec. 2, 1977, 52-162597**

**Int. Cl.³ H01L** *23/16, 23/02, 23/12*

**U.S. Cl. 357—75** **7 Claims**




1. A hybrid thick film integrated circuit assembly comprising a metallic housing, an emitter substrate type power transistor element including an emitter electrode, and a thick film integrated circuit element connected to said power transistor element for controlling said power transistor element, said power transistor element and thick film integrated element being fixedly disposed in spaced relationship within said metallic housing, said power transistor element having said emitter electrode fixedly secured in direct physical contact to said metallic housing for being in direct electrical and thermal conducting relationship with said metallic housing, and said metallic housing having said integrated circuit element electrically connected thereto and said metallic housing being a grounding terminal for said assembly.



**4,314,271**

## TWO SEMICONDUCTOR DIODE RECTIFIER STRUCTURE

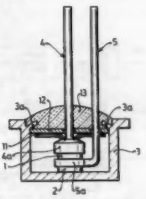
**Klaus Heyke; Günter Schmidt, both of, Reutlingen, and Istvar Ragaly, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

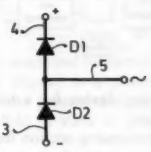
**Continuation of Ser. No. 903,909, May 8, 1978, abandoned. This application Jan. 24, 1980, Ser. No. 114,836**

**Claims priority, application Fed. Rep. of Germany, Jul. 30, 1977, 2734571**

**Int. Cl.³ H01L** *23/32, 23/02, 23/12*

**U.S. Cl. 357—76** **1 Claim**




1. A unitary two-semiconductor diode full wave rectifier structure and assembly comprising

first and second semiconductor diodes (1, 2) formed as plates or discs and connected in electrical series and geometrically stacked above each other in superposed alignment;

a first electrode (5) comprising a flat disc-shaped portion (5*a*) and a wire-like lead portion,

the disc-shaped portion being sandwiched between and aligned with said first and second diode plates or discs, the wire-like lead portion extending from the disc-shaped portion laterally of and essentially parallel to the alignment axis of the stack;

a second electrode (4) having an enlarged head portion with an end face placed in contact with the side of said first diode (1) remote from said first electrode (5) and in alignment therewith and having a substantially wire-like connecting portion;

a third electrode (3) comprising a unitary substantially cup-shaped element, and disposed to coaxially surround the stack formed by said plate or disc diodes and said first and second electrodes,

the interior bottom wall of said third electrode (3) being in contact with the side of said second diode (2) remote from said first electrode (5);

said third electrode (3) having an inwardly projecting lip;

a spring (11) supported by said rim and exerting an axial force on the head portion (4*a*) of said second electrode in contact with the first diode, thereby holding said stack formed by the head portion of the second electrode and first diode (1), the flat, disc-shaped portion of said first electrode (5) between said diodes, and said second diode (2) in pressure-contact with the interior bottom wall of said third electrode (3);

a seat (13) composed of a resinous mass applied to the top of said cup-shaped element (3) said seal sealing by embedding the lip of said electrode;

and a cover plate (12) disposed between said inwardly extending rim or lip and said spring for covering the opening of said cup-shaped third electrode (3) and retaining said

spring, and having apertures permitting the passage of the wire-like portions of said first and second electrodes (4,5).

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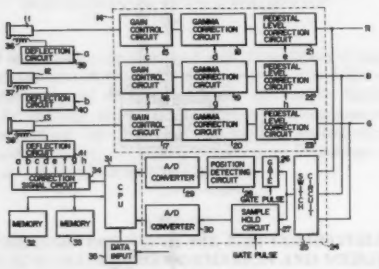
4,314,272

## ADJUSTING DEVICE FOR COLOR TELEVISION CAMERA APPARATUS

Yoshimori Miyaji, Tokyo; Hirokazu Fujiki, Asakusabashi, and Fumio Takahashi, Inagi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 8, 1980, Ser. No. 138,557
Claims priority, application Japan, Apr. 9, 1979, 54/42822
Int. Cl.³ H04N 9/62
U.S. Cl. 358—10 6 Claims




1. An adjusting device for a television camera apparatus which comprises:

(a) a signal processing section for processing video signals which correspond to the pattern of a test chart and which contain adjusting data,

(b) a data detecting section for detecting the adjusting data from said video signals which are supplied from said signal processing section,

(c) an arithmetic operation section for calculating correcting data from reference data and said adjusting data detected by said data detecting section,

(d) a correction signal circuit for converting the correcting data calculated by said arithmetic operation section into a correcting signal and supplying said correcting signal to said signal processing section and also to a deflection circuit,

(e) a manual correcting data generating means for manually issuing manual correcting data used to correct adjustment errors occurring inherently in said television camera apparatus, and

(f) a memory section for storing said manual correcting data and also storing either one of said reference data and said calculated correcting data as reference data,

whereby said arithmetic operation section adds said manual correcting data to said reference data to provide adjusting data.

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4,314,273

## CHROMINANCE TRANSCODER

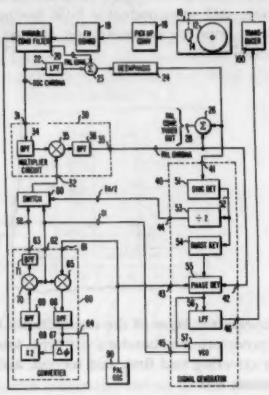
John G. Amery, Danville, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 29, 1980, Ser. No. 154,597
Int. Cl.³ H04N 9/42
U.S. Cl. 358—11 14 Claims

1. A transcoder for converting a chrominance input signal of a first format to a chrominance output signal of a second format, said chrominance input signal being subject to spurious timebase errors, said transcoder comprising:

multiplier means responsive to said chrominance input signal and to first and second conversion signals supplied thereto during mutually exclusive time intervals for concurrently effecting frequency translation and timebase correction of said chrominance input signal to produce said chrominance output signal; and

circuit means for producing and supplying said conversion signals to a common input of said multiplier means, said conversion signals being supplied during alternate time




intervals and having differing frequency components, each of said conversion signals including a timebase error correction component, one of said conversion signals including a component for effecting phase reversal of a selected component of said chrominance output signal.

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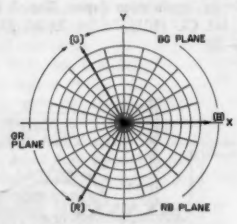
4,314,274

## DIGITAL COLOR CORRECTION METHOD

Hitomi Atoji, and Mitsuhiko Yamada, both of Kyoto, Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Feb. 22, 1980, Ser. No. 123,736
Claims priority, application Japan, Feb. 28, 1979, 54-21938
Int. Cl.³ H04N 1/46
U.S. Cl. 358—80 5 Claims




1. A method for carrying out a color correction in a digital manner, comprising the steps of:

representing in a curvilinear coordinates system a resultant value corresponding to a combination of color separation signals obtained by photoelectrically scanning a color original picture,

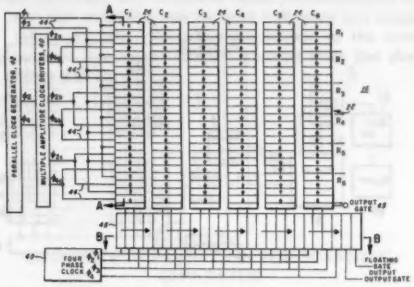
said representing step including representing said resultant value as a vector extending radially from the center of the coordinates system, wherein the angle of the vector with respect to a standard radial axis, and the size of the vector represent hue and saturation corresponding to the combination of the color signals, and

transforming the coordinates of the resultant value represented by said vector by operating the color separation signals, thereby obtaining a combination of color corrected color separation signals.

## 4,314,275
## INFRARED TIME DELAY WITH INTEGRATION CTD IMAGER

Richard A. Chapman, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 24, 1980, Ser. No. 132,911
Int. Cl.³ H04N 7/18
U.S. Cl. 358—113 12 Claims



1. An infrared energy detector system comprising:

(a) a scanning assembly for scanning at a preselected rate a scene emanating infrared energy;

(b) an infrared detector matrix of charge coupled devices in the scanning path of the scanning assembly for converting the impinging infrared energy into electrical charge packets representative of received infrared energy, said infrared detector matrix comprising a plurality of charge coupled device elements arranged in rows and columns, elements of the columns of charge coupled devices selectively connected together to form a plurality of integration stages, and means for applying selected phase clock pulses to said integration stages to synchronize the movement of the charge packets through said matrix with the image of the scene scanned by the scanning assembly, at least two of said phase clock pulses having the same phase but different amplitude, to produce electrical charge packets in the first stage which are integrated with the charge packets to each succeeding stage of the plurality of integration stages to provide time delay with integration of charge packets within said matrix thereby producing integrating signals representative of the scene; and

(c) signal processing means for processing the integrated signals into video signals representative of the infrared energy emanating from the scene.

## 4,314,276
## AUTOBORESIGHTING ELECTRO-OPTICAL SYSTEM

Martin G. Woolfson, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

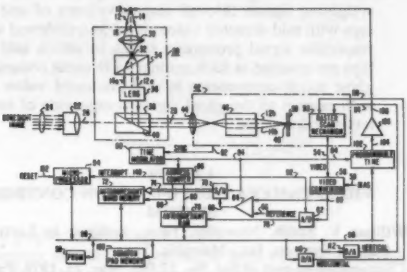
Filed Feb. 5, 1980, Ser. No. 118,817
Int. Cl.³ H04N 7/18
U.S. Cl. 358—125 10 Claims

1. In an electro-optical system including a light source for emitting a beam of light with a reference axis; a boresighted image having a boresight axis; an electro-optical sensor for sensing images within a field of view thereof; a combination of optical elements aligned for rendering said boresight image axis substantially colinear with said light beam reference axis and for guiding said combined light beam and boresighted images with colinear axes spatially fixed concurrently to the field of view of said electro-optical sensor, said electro-optical sensor being operative to generate sequentially frames of electrical information in a raster scan format, said electrical information of each frame being representative of the combination of light beam and boresighted images in a field of view of said sensor, an improvement comprising:

means for controlling said light source to effect a coded time pattern of light beam image intensity variations as sensed by said electro-optical sensor over a predetermined number of sequentially generated frames thereof;

means for discriminating at least a portion of said sensed light beam image from said sensed boresighted image in the electrical information of said predetermined number of sequentially generated frames based on said coded time pattern of said sensed light beam image;

means for determining a position of said discriminated portion of said sensed light beam image in the raster scanned field of view of said electro-optical sensor;



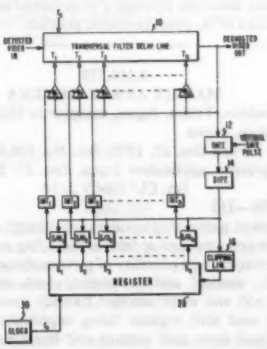
means for establishing a positional relationship of said determined position with respect to a predetermined frame reference position in the generated frame information of said raster scanned field of view of said electro-optical sensor; and

means for adjusting the raster scanned field of view in said generated frames of electrical information as a function of said established positional relationship to converge said determined position to said predetermined frame reference position, thereby referencing the boresight image axis substantially to said predetermined frame reference position in the generated frames of electrical information.

## 4,314,277
## INPUT-WEIGHTED TRANSVERSAL FILTER TV GHOST ELIMINATOR

Dalton H. Pritchard, Princeton, N.J., and Alfred C. Schroeder, Southampton, Pa., assignors to RCA Corporation, New York, N.Y.

Filed May 7, 1980, Ser. No. 147,629
Int. Cl.³ H04N 5/21
U.S. Cl. 358—167 10 Claims



1. In a television receiver, including means for detecting a

video signal which is subject to contamination by ghost signal components, a television signal ghost eliminator comprising:

a transversal filter delay line including an input terminal, an output terminal at which a processed video signal is produced, a plurality of signal processing stages serially coupled between said input and output terminals, and a plurality of input taps, respective ones of which are coupled to respective ones of said signal processing stages;

means for applying said detected video signal to said input terminal;

means responsive to said processed video signal for developing a plurality of weighting signals; and

means for effecting combination of respective ones of said weighting signals through respective ones of said input taps with said detected video signal as transferred to said respective signal processing stages to which said input taps are coupled in such manner as to cause reduction of ghost signal components in said processed video signal with respect to the ghost signal components of said detected video signal.

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**4,314,278**

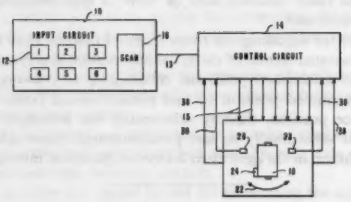
## VIDEO CAMERA MULTIFUNCTION CONTROL SYSTEM

**William V. Smith, Memphis, Tenn., assignor to Lectrolarm Custom Systems, Inc., Memphis, Tenn.**

**Continuation-in-part of Ser. No. 22,505, Mar. 21, 1979, Pat. No. 4,225,886, which is a continuation-in-part of Ser. No. 851,812, Nov. 16, 1979, Pat. No. 4,152,696. This application Jul. 25, 1979, Ser. No. 60,463**

**Int. Cl.³ H04N *5/30***

**U.S. Cl. 358—210** **28 Claims**




**25.** A video camera system comprising: a plurality of video cameras; a control means associated with each of said video cameras; and means for selectively providing a plurality of control signals to each of said control means for controlling the operation of each of said video cameras; each of said control means including positioning means for causing the associated said video camera to assume a predetermined position when said positioning means is actuated and automatic sweeping means for causing said video camera to scan at randomly selected time intervals through a preselected sweep angle and to then return to its predetermined position.

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**4,314,279**

## MATRIX ARRAY CAMERA

**Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries, Ltd., Tokyo, Japan**

**Filed Dec. 31, 1979, Ser. No. 108,594**

**Claims priority, application Japan, Dec. 27, 1978, 53-164941**

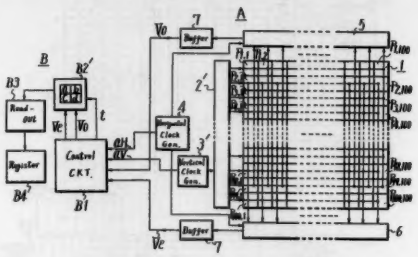
**Int. Cl.³ H04N *3/14***

**U.S. Cl. 358—212** **3 Claims**

1. An image processing system comprising:

(a) a matrix array camera apparatus including an image sensing device comprising a plurality of picture elements arranged in a matrix, vertical and horizontal clock signal generator means, odd and even number transfer means, and a shift register, said shift register being supplied with a vertical clock signal from said vertical and horizontal clock signal generator means for simultaneously driving image information from said picture elements on at least two adjacent horizontal lines of said matrix to transfer said image information to said odd and even number transfer means, said odd and even number transfer means being supplied with a horizontal clock signal from said vertical and horizontal clock generator means for simultaneously outputting the image information of the picture elements of said two adjacent horizontal rows; and

(b) an image signal processing apparatus for processing the image information comprising a control circuit for receiving




said image information from said two adjacent horizontal rows as well as said vertical and horizontal clock signals for generating a timing signal therefrom and a temporary memory for temporarily serially storing the image information and outputting it therefrom in accordance with the timing signal received from said control circuit, said temporary memory having fewer memory cells than the number of picture elements of said at least two adjacent horizontal lines.

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**4,314,280**

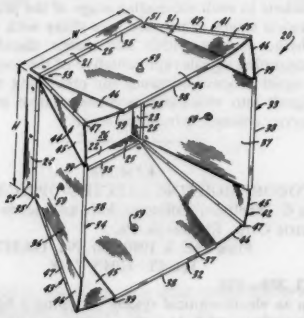
## ADJUSTABLE LIGHT SHIELD

**Joseph K. Rose, 1960 Linden Ave., Highland Park, Ill. 60035**

**Filed Dec. 5, 1979, Ser. No. 100,475**

**Int. Cl.³ H04N *5/64***

**U.S. Cl. 358—255** **24 Claims**



1. An adjustable shield comprising:

a base encompassing at least three sides of an interface;

at least three shield panels, each hinged to the base and projecting outwardly of one side of the interface, at least on shield panel comprising two side walls separated by an interwall space and joined along their outer edges by an end wall;

at least two corner units, each composed of two corner panels interconnected along a corner line, bridging the corner gaps between adjacent shield panels, each corner panel being paired with one of the shield panels in parallel surface alignment and two of the corner panels being

aligned with and extending into the interwall space of the one shield panel in overlapping relation to each other;

guide means for slidingly mounting each corner unit on two adjacent shield panels, for defining an outer limit for a range of angular movement for each of the shield panels, and for maintaining each corner unit in pivotal alignment with the associated shield panels throughout their ranges of angular movement; and

each shield side wall of the one shield panel includes a friction pad projecting into the inter-wall space into engagement with the non-overlapping portion of the corner panel in that space which is fartheset from that shield panel wall.

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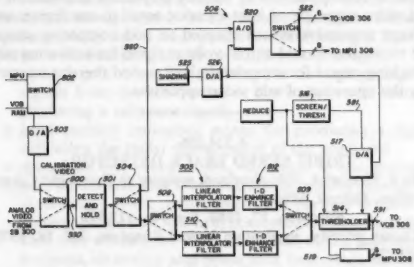
## 4,314,281
## SHADING COMPENSATION FOR SCANNING APPARATUS

**Douglas G. Wiggins, Penfield, N.Y., and Pierre Elie, Jr., Westminister, Calif., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Oct. 12, 1979, Ser. No. 84,035**
**Int. Cl.³ H04N 1/38, 1/40**
**U.S. Cl. 358—280** **11 Claims**




1. A method of compensating for variations in light to which individual image sensors of a scanning array are subjected, the steps comprising:

(a) processing image signals output by said sensors when scanning original images to provide multi-bit digital signals representative of the image gray level in a first operating mode;

(b) processing image signals output by said sensors when scanning original images to provide single bit binary level signals representative of the image in a second operating mode;

(c) producing a separate test signal from each sensor in said array by scanning a test image of predetermined optical density;

(d) segregating said sensors into groups each comprised of a preset number of sensors;

(e) processing said test signals from said sensors in said first operating mode to provide multi-bit test signals;

(f) averaging the test signals from each of the sensors in said sensor groups to provide composite compensating signals for each of said sensor groups;

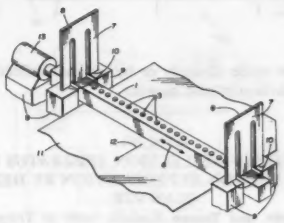
(g) storing said compensating signals; and

(h) correcting the image signal output of said sensors in both said first and second operating modes with the stored compensating signal for the sensor group within which said sensor is included.

## 4,314,282
## MULTIFUNCTION GRAPHIC ENGINE BASED ON AN OSCILLATING SCANNER

**Kenneth H. Fischbeck, Dallas; Allen T. Wright, Lewisville; Lee L. Bain, Arlington, all of Tex., and Demetris E. Paraskevopoulos, Pittsford, N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Apr. 14, 1980, Ser. No. 140,364**
**Int. Cl.³ H04N 1/10, 1/2**
**U.S. Cl. 358—286** **5 Claims**



1. A graphic engine comprising:

a support member for supporting both an array of image-reading elements and an array of image-marking elements, said image-reading elements and said image-marking elements being arranged parallel to an axis of said support member;

an image-reading station including means for maintaining a document to be read in image-reading relationship to said image-reading elements;

an image-marking station including means for maintaining a record-receiving member in image-marking relationship to said image-marking elements;

means for suspending and oscillating said support member in spaced relationship to said image-reading station and said image-marking station, said means including:

a frame;

flexure means mounted on said frame and attached to said support member for allowing oscillating movement of said support member in a direction parallel to said axis of said support member and in spaced relationship to said image-reading station and said image-marking station, said flexure means being a multiple compounded cantilever spring;

oscillating means mounted on said frame and connected to said support member for oscillating said support member; and

means for providing relative movement between a document to be copied and a record-receiving member and said image-reading station and said image-marking station, respectively.

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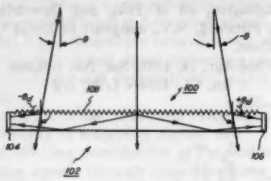
## 4,314,283
## DIFFRACTION BASED LIGHT COLLECTOR

**Charles J. Kramer, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Sep. 2, 1980, Ser. No. 183,121**
**Int. Cl.³ H04N 1/24**
**U.S. Cl. 358—294** **16 Claims**

1. A light collector comprising a transparent elongated member having at least one photodetector placed thereon, said member having on one surface thereof a longitudinally extend-

ing diffraction grating, said grating having a period selected so as to cause light incident on said grating to be coupled to said



photodetector either directly or by internal reflection along the interior surface of said member.

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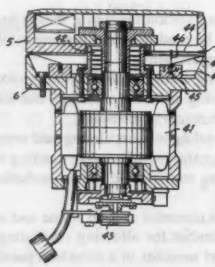
**4,314,284**

## VIDEO HEAD DEFLECTION APPARATUS FOR SPECIAL MOTION REPRODUCTION BY HELICAL SCAN VTR

**Yoshihiko Sato, and Tatsuo Konishi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed Nov. 7, 1979, Ser. No. 91,195**
**Claims priority, application Japan, Nov. 7, 1978, 53-136953**
**Int. Cl.³ G11B *21/18, 21/10***
**U.S. Cl. 360—10** **7 Claims**



1. A video head deflection apparatus for a helical scan video tape deck, said helical scan video tape deck comprising means for controlling the transportation of a tape on which a video signal has been recorded to produce a plurality of parallel video tracks formed diagonally with respect to the lengthwise direction of said tape, guide drum means for guiding said tape along the periphery thereof, said guide drum means comprising upper and lower drums, rotary head means provided between said upper and lower drums and rotating at a predetermined rotational speed, said rotary head means including a revolving shaft and at least one magnetic head for scanning said tape being guided along said drum for scanning said tape being guided along said drum means, and driving means arranged coaxially with said revolving shaft of said rotary head means for causing the rotation of said rotary head means, said deflection apparatus comprising:

a coil assembly arranged coaxially with said revolving shaft of said rotary head means; and

a magnetic element arranged coaxially with said revolving shaft of said rotary head means and in opposed relationship with said coil assembly, the relative position between said coil assembly and said magnetic element being changed in response to an electromagnetic force by an electric current applied to said coil assembly, said rotary head means being coupled to one of said coil assembly and said magnetic element, whereby said rotary head is displaced in a direction normal to the rotational path of said rotary head means.

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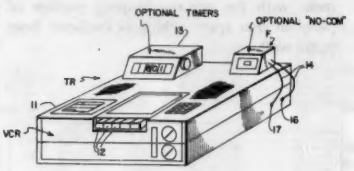
**4,314,285**

## EDITING SYSTEM FOR VIDEO APPARATUS

**Edgar L. Bonner, 325 E. Main Ave., Taylorsville, N.C. 28681, and Nelson A. Faerber, 900 Sixth Ave. South, Naples on the Gulf, Fla. 33940**

**Filed May 11, 1979, Ser. No. 38,161**
**The portion of the term of this patent subsequent to Mar. 31, 1998, has been disclaimed.**
**Int. Cl.³ H04N *5/48, 5/76***
**U.S. Cl. 360—33** **10 Claims**




1. An editing system for video apparatus comprising, in combination, switching means for controlling the operation of said video apparatus, means for detecting the voltage level of the video signal in said video apparatus, means connected to a source of power for providing a reference voltage, means for coupling said detecting means to a source of the video signal in said video apparatus, means coupled to said detecting means and responsive to said reference voltage for comparing said detected voltage level with said reference voltage to provide an output voltage signal when the voltage level of said video signal is diminished due to absence of picture information in said video signal for at least a period equal to one frame, and voltage responsive means coupled to said comparing means and responsive to said output voltage signal for activating said switching means for a predetermined period thereby controlling the operation of said video apparatus.

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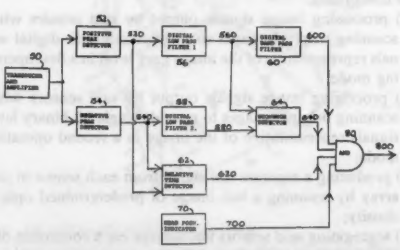
**4,314,286**

## TRIBIT SERVO TRACK DETECTOR

**John F. Hardwick, Fife, Scotland, assignor to Burroughs Corporation, Detroit, Mich.**

**Filed Jan. 17, 1980, Ser. No. 112,975**
**Claims priority, application United Kingdom, Jul. 18, 1979, 25060/79**
**Int. Cl.³ G11B *5/09***
**U.S. Cl. 360—40** **10 Claims**



1. An apparatus for detecting and identifying a tribit signal, the signal so tested is produced when a transducer reads a particular track on a rotary disk, said apparatus comprising:

a sequence detector means, connected to the transducer, for detecting the presence of the tribit characteristic feature of two negative pulses for every positive pulse and producing an affirmative indication when the sequence characteristic is detected;

a frequency testing means, connected to the transducer, for determining whether the positive pulse appears at the frequency rate characteristic of tribit signals and produc-

ing an affirmative indication when this frequency characteristic is detected; and,

a coincidence means, connected to the output of said sequence detector means and said frequency testing means for generating a tribit-present-signal when affirmative indicators are received from said sequence detector means.

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## 4,314,287

## HIGH STORAGE DENSITY DISC FILE

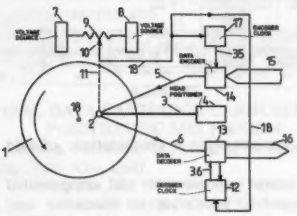
**Ian B. Freeman, Leslie; John O. Rooney, and John F. Hardwick, both of Glenrothes, all of Scotland, assignors to Burroughs Corporation, Detroit, Mich.**

**Filed Apr. 8, 1980, Ser. No. 138,470**

**Claims priority, application United Kingdom, Apr. 11, 1979, 12826/79**

**Int. Cl.³ G11B *5/09***

**U.S. Cl. 360—51** **10 Claims**



1. A recording/decoding clock generator for use in a high density disk storage system having a disk rotating at a constant angular velocity and a head positioner, positioning a head to interact with selectable tracks on a disk, comprising:

an analog gate means for allowing the through passage of signals from the head when in the write mode, thereby producing a reference signal;

a head position indicating means for producing a signal indicating the radial displacement of the head; and

a phase lock loop clock means, connected to said analogue gate means and said head position indicating means, for producing a clock output to control the rate of data recording on the disk and to synchronize the data decoding, such that when in the write mode said analog gate means is closed, depriving said phase lock loop clock means of said reference signal, and causing said phase locked loop clock means to free-run at a frequency proportional to the radial displacement of the transducer head, and such that, when in the read mode said analog gate means is open allowing a through passage of said reference signal from the head to said phase locked loop clock means and causing said phase locked loop clock means to adjust its clock output frequency and the phase relationship between its clock output signal and said reference signal to achieve synchronism.

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## 4,314,288

## AMPLITUDE AND PHASE EQUALIZER

**Maung Gyi, San Francisco, Calif., assignor to Ampex Corporation, Redwood City, Calif.**

**Filed Aug. 29, 1980, Ser. No. 182,352**

**Int. Cl.³ G11B *5/45, 5/02***

**U.S. Cl. 360—65** **18 Claims**

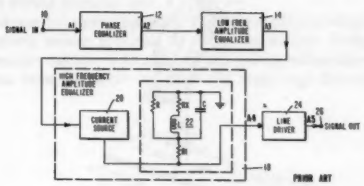
1. An amplitude and phase equalization circuit, comprising in combination:

an input terminal for receiving an input signal to be amplitude and phase equalized within a given frequency band;

a first amplifier means having an inverting input, a non-inverting input coupled to ground, and an output for providing an amplitude equalized output signal;

a first passive filter means coupled between said input terminal and said inverting input of said first amplifier means to provide an increasing amplitude characteristic with frequency at said output of the first amplifier means within a known high frequency portion of said given frequency band;

a second passive filter means coupled between said output and inverting input of said first amplifier means to provide a decreasing amplitude characteristic with frequency at said output of the first amplifier means within a known low frequency portion of said given frequency band, said amplitude equalized output signal obtained at said output of the first amplifier means having a non-linear phase characteristic with frequency within said given frequency band;



a second amplifier means having an inverting and a non-inverting input, respectively, and an output, an input impedance coupled between said output of said first amplifier means and said inverting input of the second amplifier means, a feedback impedance coupled between said output of the second amplifier means and its inverting input; and

a third passive filter means of a selected order coupled between said output of the first amplifier means, said non-inverting input of the second amplifier means and ground, respectively, to provide at said output of the second amplifier means an amplitude and phase equalized output signal having a substantially linearly increased amplitude with respect to said output signal of said first amplifier means and having a substantially linear phase characteristic with frequency within said given frequency band.

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## 4,314,289

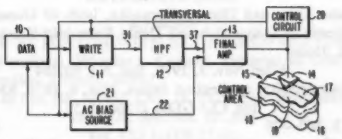
## BIASED PULSED RECORDING SYSTEMS AND METHODS

**Munro K. Haynes, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 7, 1979, Ser. No. 101,350**

**Int. Cl.³ G11B *21/10, 5/09***

**U.S. Cl. 360—77** **28 Claims**



12. A data recording apparatus having a transducer with a single gap and adapted to be in operative engagement with a record medium having a prerecorded low frequency control signal,

a recording portion having high pass filter means for supplying data signals to said transducer and having frequency components substantially of higher frequency than said control signal,

AC bias means connected to said transducer for linearly adding an AC bias signal to said filtered recording signal, and

readback means connected to said transducer for sensing said control signal whenever said recording means is supplying said data signal.

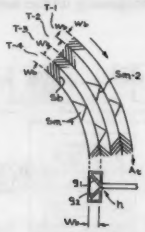
## 4,314,290
## DI-BIT RECORDING TECHNIQUE AND ASSOCIATED SERVO INDICIA

**Herbert U. Ragle, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.**

**Continuation of Ser. No. 970,441, Dec. 18, 1978, abandoned, which is a continuation of Ser. No. 807,155, Jun. 16, 1977, Pat. No. 4,166,282. This application Apr. 14, 1980, Ser. No. 139,919**

**Int. Cl.³ G11B** *5/56, 21/10*

**U.S. Cl. 360—77** **9 Claims**



1. In a method of recording digital records by impressing data marks along relatively parallel tracks, in either a first or a second skew orientation, these orientations being transverse to one another, the improvement therein of:

arranging di-gap transducer means adapted to impress and/or detect such data marks along any given track; and

operating said transducer means to selectively impress such data marks along selected tracks as called-for, while also operating the transducer means to selectively impress "LAMBDA" registration indicia along each given track whereby to facilitate transducer positioning along the track, these indicia taking the form of a "V configuration" or an "inverted V"(or "A") configuration and consisting of a pair of orthogonal intersecting registration marks, each such registration mark being aligned along a respective one of the skew orientations;

whereby said data marks and said registration indicia may be impressed and/or detected by common di-gap transducer means; and whereby one may so record along said tracks with little or no concern for inter-track "guard bands"; said registration marks facilitating self-centering along any given track when so used with such a di-gap transducer means.

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## 4,314,291
## SELF-COMPENSATING DEVICE FOR A MAGNETIC DISC APPARATUS

**Yasutaka Oda, and Hiromi Hamaoka, both of Oume, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Nov. 1, 1979, Ser. No. 90,264**

**Claims priority, application Japan, Nov. 8, 1978, 53-136655**

**Int. Cl.³ G11B** *21/08, 5/55*

**U.S. Cl. 360—78** **9 Claims**

1. Self-compensating apparatus for a magnetic disc apparatus comprising:

(a) magnetic disc means with a number of data tracks and a number of servo tracks, said data tracks being concentrically arranged on a surface of the magnetic disc means and said servo tracks being concentrically arranged on a surface of said magnetic disc means;

(b) read/write transducer means for reading out data from or writing data into said data tracks;

(c) servo transducer means for reading out servo data from said servo tracks;

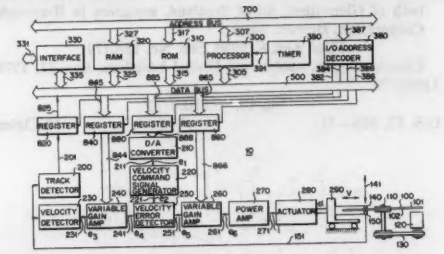
(d) actuator means for reciprocally moving said read/write and servo transducer means across said data and servo tracks;

(e) track detector means responsive to an output signal of said servo transducer means to produce a pulse each time said servo transducer means crosses a servo track;

(f) velocity detecting means which detects the velocity of said servo transducer means to produce a velocity signal;

(g) velocity error detector means responsive to said velocity signal and a velocity command signal to produce a velocity error signal;

(h) compensator means responsive to said velocity error signal to produce a compensated velocity error signal,



thereby compensating a characteristic of said actuator means;

(i) drive means responsive to said compensated velocity error signal to accelerate or decelerate said actuator means so as to make compensated velocity error signal small; and

(j) control means for supplying said velocity command signal, and for adjusting said compensator means responsive to said output pulses of said track detector means and a given velocity command signal.

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## 4,314,292
## MAGNETIC RECORDING OR REPRODUCING APPARATUS

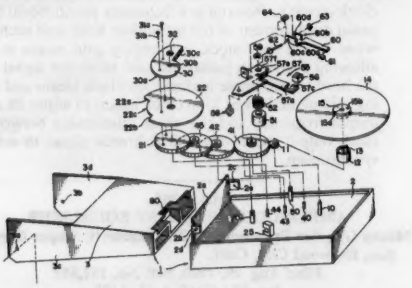
**Takayuki Umaba, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan**

**Filed Apr. 3, 1980, Ser. No. 136,851**

**Claims priority, application Japan, Apr. 7, 1979, 54-46397[U]**

**Int. Cl.³ G11B** *5/82, 17/00, 21/12*

**U.S. Cl. 360—86** **10 Claims**



1. A magnetic recording or reproducing apparatus comprising:

(1) a magnetic body for recording or reproducing information;

(2) a magnetic head for sensing said information;

(3) means for mounting said magnetic body;

(4) means for supporting said magnetic body;

(5) means for driving and rotating said magnetic body mounting means;

(6) means for supporting said magnetic head;

(7) means for mounting said magnetic head supporting means;
(8) means for pressing said magnetic head to thereby clamping said magnetic body;
(9) means for detecting the position of said magnetic head supporting means;
(10) means for mounting said position detecting means;
(11) a cam mounted integrally on said position detecting means;
(12) means for sliding along and in abutment with the cam face of said cam;
(13) said sliding means mounted integrally with said magnetic head supporting means;
(14) means for rotating said magnetic head supporting means against the action provided by the movement of said sliding means;
(15) means for transmitting the rotating force provided by said driving means to said position detecting means in a decelerating manner; and
(16) means for sensing the position for starting and terminating recording or reproduction of said information.

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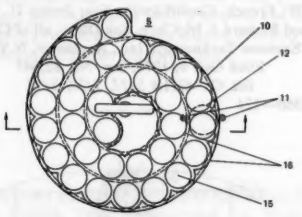
## 4,314,293
## SPIRAL DATA CARTRIDGE CAROUSEL AND POSITIONING MECHANISM

**Gary R. Paulson, Meridian, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jun. 25, 1979, Ser. No. 51,921**
**Int. Cl.³ G11B *22/04, 15/66***
**U.S. Cl. 360—92** **8 Claims**




1. Apparatus for storing and transporting digital data comprising:
a chassis;
a carousel having a plurality of cavities arranged in a spiral array for storing and transporting a plurality of magnetic tape cartridges having data stored therein;
mounting means for slidably and rotatably mounting the carousel to the chassis;
fetching means fixedly mounted to the chassis for loading and unloading the cartridges from the carousel;
drive means coupled to the mounting means for selectively positioning a desired cartridge at the fetching means in response to rotating the carousel about its approximate center.

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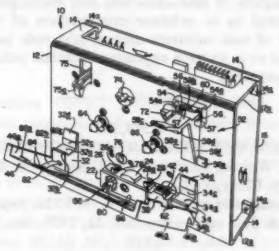
## 4,314,294
## TAPE CASSETTE HOLDER

**Pasquale R. Riccio, Salem, and George H. Manning, Nashua, both of N.H., assignors to MFE Corporation, Salem, N.H.**

**Filed Apr. 14, 1980, Ser. No. 139,672**
**Int. Cl.³ G11B *15/24, 23/04***
**U.S. Cl. 360—96.6** **15 Claims**

1. A tape cassette holder comprising
A. a general support surface,
B. a read/write head mounted to the support surface,
C. a pair of spaced-apart rotary drive spindles projecting from the support surfaces adjacent the read/write head,
D. a pair of abutments mounted to the support surface on opposite sides of the read/write head, said abutments having positioning surfaces located more or less in the same plane as the read/write head,
E. a generally rectangular door,
F. means for hinging one long edge of the door to the support surface, said hinge line being parallel to the plane defined by said positioning surfaces and being located adjacent that plane, said door being swingable between a closed or operating position wherein the door lies more or less parallel to the support surface and an open or loading position wherein the door lies at an angle with respect to the support surface,
G. means for releasably locking the door when the door is in its closed position, and
H. means for establishing the door in its open position, and
I. spring means mounted to the door surface facing the support surface, a first pair of said spring means extending out from the door near said one long edge thereof and



resiliently engaging said abutments so as to bias the door toward its open position, a second pair of said spring means extending out from the door near the opposite edge thereof so that
(1) when the door is in its open position, a conventional tape cassette having an active edge and sprocket holes and positioning pin openings in its faces can be placed onto the door so that its active edge is positioned by said abutments and a face of the cassette is positioned by the spring means and,
(2) when the door is moved to its closed position, said first pair of spring means urge the active edge of the cassette onto said positioning surfaces so as to locate said edge with respect to the read/write head and said spring means also resiliently bias the cassette against the support surface so that said drive spindles seat properly in the sprocket holes in a face of the cassette.

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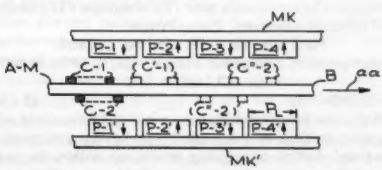
## 4,314,295
## LINEAR ACTUATOR WITH STAGGERED FLAT COILS

**Jorgen Frandsen, Winnipeg, Canada, assignor to Burroughs Corporation, Detroit, Mich.**

**Division of Ser. No. 85,945, Oct. 18, 1979. This application Dec. 26, 1979, Ser. No. 107,069**
**Int. Cl.³ G11B *21/02***
**U.S. Cl. 360—106** **21 Claims**




1. In an improved magnetic linear actuator means fro a disk drive adapted to reciprocate and position load means along a

prescribed linear path and including two or more flat-coil means disposed on at least one side of a relatively thin, planar substrate means and also including associated magnet means comprising one or more pairs of like magnet pole pieces disposed opposingly on opposite sides of said path so as to interact inductively and drivingly with said coil means, whereby to induce the rapid, efficient and controlled translation of the substrate means along said linear path, positioningly, and in accordance with appropriate energizing current through selected coil means; the improvement therein comprising:

the operative disposition of said coils relative to one another and to said pole pairs renders them vertically offset and overlapping so as to interact with said coils spaced vis-a-vis each other on said substrate means so that when one or more flat-coil means is energized and induced to translate the substrate means along a prescribed excursion, it will be so positioned relative to said poles and to further additional flat-coil means, that the latter will be moved into operative position relative to prescribed pole pairs before termination of said excursion and thereupon may be so energized as to produce continuation of the actuating thrust of said substrate means; said pole pairs being arranged so as to have opposing magnetic polarity between adjacent pairs.

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**4,314,296**

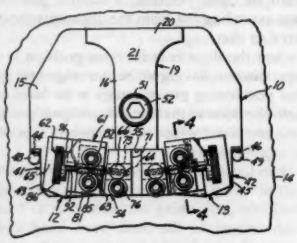
## TRANSDUCER HEAD MOUNTING STRUCTURES

**William C. Whittle, La Verne, Calif., assignor to Bell & Howell Company, Chicago, Ill.**

**Continuation-in-part of Ser. No. 939,533, Sep. 5, 1978, abandoned. This application Dec. 12, 1979, Ser. No. 102,801**

**Int. Cl.³ G11B *5/56, 21/24***

**U.S. Cl. 360—109** **55 Claims**



1. A mount for a pair of transducer heads, comprising in combination:

a base and integral riser beam jointly forming a rigid inverted T-shaped structure wherein said riser beam extends perpendicularly to a midportion of said base; and

means connected to said base and to said riser beam for mounting said transducer heads on opposite sides of said riser beam.

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**4,314,297**

## PROCESS FOR GENERATING A MAGNETIC INDUCTION FIELD WITHIN A MAGNETIC MEDIUM

**Jean-Pierre Lazzari, Montfort l'Amaury, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France**

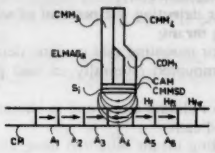
**Filed Dec. 18, 1979, Ser. No. 104,859**

**Claims priority, application France, Apr. 6, 1979, 79 08713**

**Int. Cl.³ G11B *5/12***

**U.S. Cl. 360—113** **13 Claims**

1. A process for generating a magnetic induction field within a magnetic medium of a degraded type having a magnetically unsaturated portion comprising producing within the unsaturated portion a magnetic energizing field, generating a selection wave and propagating said wave along at least one given path of said medium, starting from a given datum point and from a reference instant $t_R$, and reaching each point of the said path at an instant the selection wave and the energizing field



acting simultaneously at the instant $t_i$ on an area surrounding each point of said path cause the magnetic properties of said area to be modified and the said induction field to be generated.

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**4,314,298**

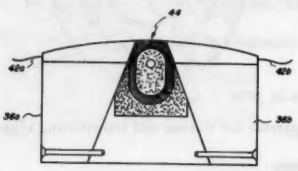
## MULTITRACK MAGNETIC HEAD EMPLOYING DOUBLE HELIX STRUCTURE

**William W. French, Cardiff-by-the Sea; James U. Lemke, Del Mar, and Richard J. McClure, San Diego, all of Calif., assignors to Eastman Technology, Inc., Rochester, N.Y.**

**Filed Oct. 9, 1979, Ser. No. 82,847**

**Int. Cl.³ G11B *5/27, 5/20, 5/12***

**U.S. Cl. 360—121** **6 Claims**



1. A multitrack magnetic head comprising:

(a) a plurality of magnetic cores having respective gaps therein,

(b) respective discrete coils on said cores, each of said coils being substantially helically wound on its corresponding core and extending from a point at one side of the gap thereof to a point at the other side of said gap without bridging said gap, and

(c) means for supporting said cores so that the gaps thereof are laterally spaced apart from each other, and in alignment, said means for supporting said cores being provided with first and second pluralities of aligned apertures which spatially coincide with respective parts of said coils, and through which apertures electrical contact may be made to said coils,

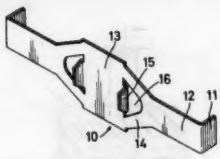
said means for supporting said cores being such that the first and second pluralities of aligned apertures of said supporting means spatially coincide with respective aligned coil parts, at least some of which are within the extreme ends of said coils and away from the gaps of their respective cores, the number of electrically active turns of said coils being dependent upon the relative proximity of said first and second pluralities of aligned apertures.

4,314,299

## PAD ASSEMBLY FOR USE IN A MAGNETIC TAPE CASSETTE

Toshihiko Ishida, and Takateru Satoh, both of Tokyo, Japan, assignors to TDK Electronics Co., Inc., Tokyo, Japan

Filed Sep. 10, 1979, Ser. No. 73,988
Claims priority, application Japan, Sep. 18, 1978, 53-127088[U]
Int. Cl.³ G11B 23/08, 15/08, 15/60
U.S. Cl. 360—130.33 3 Claims



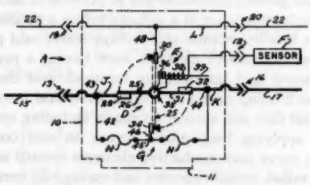

1. A pressure pad assembly for a magnetic tape cassette, said assembly comprising a substantially rectangular pad piece and a one-piece leaf spring for retaining said pad piece relative to a magnetic head having magnetic cores set therein; said leaf spring comprising a generally rectangular retaining portion for supporting the back side of said pad piece; two wing portions connected to opposed edges of said pad retaining portion; Y-shaped portions each having two legs extending from upper and lower sections of said opposite edges of said retaining portion joining the edge sections to said wing portions; the regions where said two legs of each Y portion and said retaining portion are joined together bein aligned with and overlying a core set in such recorder magnetic head.

4,314,300

## FUSED SHORT CIRCUIT AND GROUNDING SWITCH

Charles E. Griffith, 11212 Whisperwood La., Rockville, Md. 20852

Filed Nov. 9, 1979, Ser. No. 92,884
Int. Cl.³ H01H 19/10, 75/02
U.S. Cl. 361—13 23 Claims



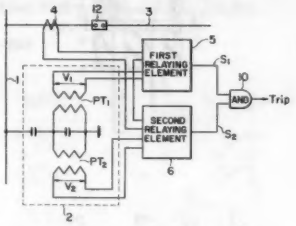

1. A fused short circuit and grounding switch for interconnection in a main circuit, said switch having switch means operable in one position thereof as a part of the normal continuity of said main circuit and operable in another position to break continuity therewith as a part of said main circuit and to provide a solid bolted fault, and including alternate circuit means interconnected to and operable to be in parallel with said switch means in said one position thereof as a part of the normal continuity of said main circuit and including fuse means, said switch being operable to short circuit said alternate circuit and clear said fuse means thereof and to thereby interrupt said main circuit on operation of said switch means to the position thereof providing a solid bolted fault.

4,314,301

## PROTECTIVE RELAYING DEVICES

Ryotaro Kondow, Tokyo, and Junichi Inagaki, Fuchu, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 22, 1979, Ser. No. 87,156
Claims priority, application Japan, Oct. 31, 1978, 53-133220
Int. Cl.³ H02H 3/38
U.S. Cl. 361—65 8 Claims




1. A protective relaying device for protecting an electric power system, comprising first and second potential transformer circuits for transforming voltages of said electric power system, a current transformer for picking up current flowing through said electric power system, first and second relaying elements connected to receive the output voltages of the first and second potential transformer circuits, respectively, and also the output of said current transformer, wherein each of said relaying elements transmits a particular logic state output when it operates, and a logic circuit delivering a tripping signal to a circuit breaker of said power system when the logic state outputs of said first and second relaying elements are the same.

4,314,302

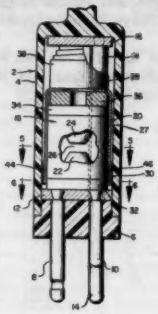
## COMMUNICATIONS CIRCUIT LINE PROTECTOR AND METHOD OF MAKING THE SAME

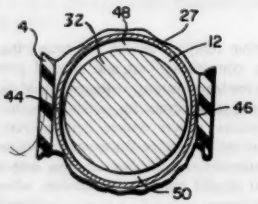
Bertram W. Baumbach, Arlington Heights, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Apr. 18, 1980, Ser. No. 141,290
Int. Cl.³ H02H 3/22
U.S. Cl. 361—119 6 Claims

1. A line protector for a communications circuit comprising a gas tube surge voltage arrester having a central axis and opposed electrodes spaced apart by a tubular insulator to define a primary arc gap, means forming a first circuit for electrically connecting one of the electrodes to ground, means forming a second circuit for electrically connecting the other electrode to a communications line, the first circuit including a tubular element surrounding said insulator, said tubular element having a skirt portion that surrounds said other electrode in spaced relation thereto to define therewith a secondary arc gap having a breakdown voltage that is greater than the breakdown voltage of the primary arc gap but less than that of the primary arc gap should the gas tube become vented, said tubular element having a non-circular cross section and being resilient and by its resiliency engaging said gas tube at localized first and second spaced regions on opposite sides of said central axis so that the gas tube and the tubular element are prevented

from radial movement relative to each other to establish and maintain said secondary arc gap at a localized region that is at






a minimum spacing between said skirt portion and said other electrode.

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**4,314,303**

## OVERVOLTAGE PROTECTION DEVICE

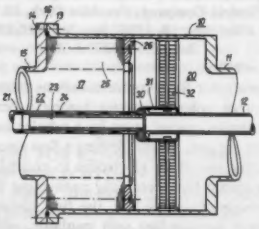
**Rainer Bitsch, Hacienda Grande 406, Queretaro, Qro., Mexico; Armin Diessner, Cicerostr. 61, 1000 Berlin 31, and Bruno Müller, Hubertusallee 54, 1000 Berlin 33, both of Fed. Rep. of Germany**

**Filed Sep. 18, 1979, Ser. No. 76,582**

**Claims priority, application Fed. Rep. of Germany, Sep. 18, 1978, 2840900**

**Int. Cl.³ H02H 9/06**

**U.S. Cl. 361—120** **16 Claims**



1. An overvoltage protection device for a gas-insulated high-voltage line including an inner conductor enclosed by a metal casing, said device comprising a low pass filter which includes an inductance adapted to be electrically connected in series with the inner conductor of the high voltage line and a capacitance electrically coupled in shunt with said inductance, said capacitance adapted to be electrically coupled between said inductance and the casing of the high voltage line.

**4,314,304**

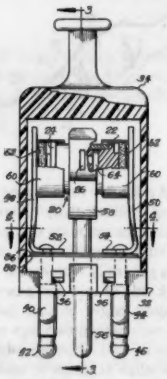
## LINE PROTECTOR FOR A COMMUNICATIONS CIRCUIT

**Bertram W. Baumbach, Arlington Heights, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.**

**Filed Mar. 27, 1980, Ser. No. 134,744**

**Int. Cl.³ H02H 9/04, 3/22**

**U.S. Cl. 361—124** **8 Claims**



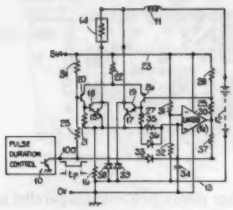
8. A line protector for a communication circuit comprising a housing of dielectric material and including a base, line pins in said base, a ground pin in said base, a gas tube surge arrester having a body in spaced relation with said base, first and second line terminals for respective connection to said line connector pins and an intermediate terminal for connection to said ground pin, said arrester including electrodes respectively connected to said terminals and comprising voltage breakdown means in the circuit between each of said line connector pins and said ground connector pin to provide in each of said circuits a high impedance at a voltage below a predetermined value and a low impedance at a voltage above said predetermined value, conductive elements each having a portion extending toward said intermediate terminal, said conductive elements each being normally spaced from said intermediate terminal, said first and second terminals including spring-bias means for applying longitudinal forces on said conductive elements to move said conductive elements toward said intermediate terminal, means opposing said spring-bias means when the current between said end terminals and said intermediate terminal is below a predetermined minimum value but operable to cause at least one of said elements to move toward said intermediate terminal to form a direct metallic ground circuit therewith when the current between said end terminals and said intermediate terminal is above said predetermined minimum value, and means forming an air gap in the circuit between each line terminal and said ground connector pin, said air gap having a breakdown voltage that is greater than the breakdown voltage of said gas tube surge arrester but less than the breakdown voltage of said surge arrester if the gas has leaked therefrom, said means forming the air gap comprising an insulating spacer defining the width of said air gap, the spacer being perforated at said air gap.

4,314,305

## SOLENOID DRIVE CIRCUITS

Malcolm Williams, Solihull; John P. Southgate, Georgeham, and Richard G. Woodhouse, Hall Green, all of England, assignors to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 34,043, Apr. 27, 1979, abandoned, which is a continuation of Ser. No. 923,741, Jul. 11, 1978, abandoned. This application Oct. 14, 1980, Ser. No. 196,427
Claims priority, application United Kingdom, Jul. 20, 1977, 30393/77
Int. Cl.³ F02M 52/00
U.S. Cl. 361—154 9 Claims



1. A solenoid drive circuit including first and second output transistors connected to the solenoid and providing parallel solenoid current paths of relatively high and low resistance respectively, means connected to an input terminal for permitting either transistor to conduct when the signal at the input terminal is in a first state and preventing both transistors from conducting when the signal is in a second state, and solenoid current sensing means controlling said second transistor so that said second transistor conducts when the signal at the input terminal is in said first state until the solenoid current rises above a predetermined level, said output transistors having their emitters connected to a first supply rail by a common resistor forming part of said solenoid current sensing means and having their collectors connected to one terminal of said solenoid by respective high and low resistance means, the other terminal of said solenoid being connected to a second supply rail.

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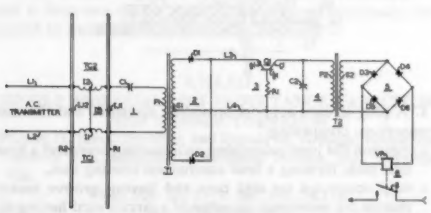
4,314,306

## SIGNAL-POWERED RECEIVER

John O. G. Darrow, Murrysville, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Jul. 14, 1980, Ser. No. 168,861
Int. Cl.³ B61L 23/16
U.S. Cl. 361—182 10 Claims



1. A signal-powered receiver comprising, an input filter for receiving a modulated carrier signal, a demodulator coupled to said input filter for detecting the modulating signal, a switching device connected to said demodulator and being turned ON and OFF by the detected modulating signal, a modulation filter connected to said switching device which is free to swing to the opposite polarity of the modulation cycle during the OFF period, and a rectifier coupled to said modulation filter for producing a d.c. output voltage for energizing a load.

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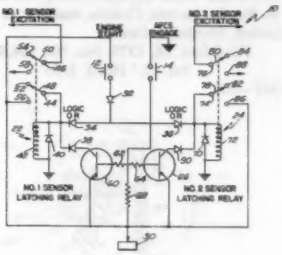
4,314,307

## ELECTRO-MECHANICAL SENSOR POWER UP CIRCUIT

Albert Sivahop, Stratford; Don L. Adams, Sr., Fairfield, and William C. Fischer, Monroe, all of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1980, Ser. No. 146,821
Int. Cl.³ H01H 63/36
U.S. Cl. 361—194 1 Claim



1. An electrical circuit for improving the useful life of a plurality of electromechanical sensors including rate gyros of an automatic flight control system of an aircraft comprising:

means for energizing a plurality of latching circuits upon command including at least one pair of push button switches closable separately or simultaneously;

a plurality of relays which are activated upon energizing separately or simultaneously of said plurality of latching circuits, said relays having means for providing electric power to said plurality of electro-mechanical sensors; and

means for energizing said plurality of electro-mechanical sensors only when the aircraft power and at least one of said pair of push button switches are on including a plurality of transistors which are short circuited upon closing of at least one of said pair of push button switches and thus energizing and keeping energized said plurality of relays during power-on interval of the aircraft.

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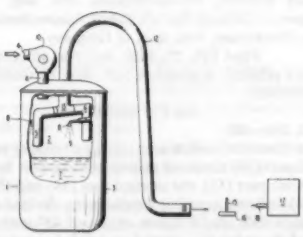
4,314,308

## INCREASING THE RATE OF NEUTRALIZATION OF STATIC ELECTRICITY

James D. Faulkner, Atlanta, Ga., assignor to Lester Laboratories, Inc., Atlanta, Ga.

Filed Oct. 6, 1980, Ser. No. 194,329
Int. Cl.³ H05F 3/00
U.S. Cl. 361—212 18 Claims



1. A process for neutralizing a static electric charge on a

surface, said process consisting essentially of contacting an atmosphere with a least one aqueous static charge composition by spraying an effective amount of said static charge composition into said atmosphere, and contacting the resulting treated atmosphere with a surface having static electric charge thereon, to thereby neutralize at least a portion of said charge, wherein said static charge composition is prepared from substantially deionized water to thereby increase the rate at which said charge is neutralized when compared with the rate of neutralization produced under the same conditions but with a static charge composition prepared from water that has not been substantially deionized.

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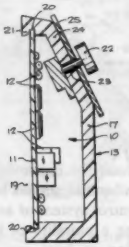
**4,314,309**

## ELECTRIC TEST EQUIPMENT MOUNTING

**Clifford D. Read, Almonte, Canada, assignor to Northern Telecom Limited, Montreal, Canada**

**Filed Dec. 18, 1979, Ser. No. 104,886**
**Int. Cl.³ H05K *5/06***
**U.S. Cl. 361—331** **4 Claims**



1. An assembly of electrical or electronic test equipment for a telecommunications or power cable and a protective mounting, in which the mounting is of integral one piece molded construction and has walls defining a space of fixed shape determined by the molded construction, the space containing the equipment, the walls are formed of a closed cell foam and define an opening of fixed shape for insertion of the equipment into the space, the equipment is mounted upon and projects from a planar support which has outside dimensions greater than dimensions between said walls and across said space, the equipment is held within the space by the support engaging and outwardly resiliently urging the foam material at the inner surface of the walls defining the space to close the opening, the support is detachable by movement through the opening transversely to the plane of the support and the equipment is provided with at least one control switch which projects exteriorly from a switch mounting wall which is devoid of said opening, the switch rotatably and sealingly received through a hole formed in the switch mounting wall.

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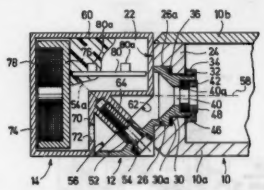
**4,314,310**

## ELECTRICAL SWITCH

**Eberhard Schmidt, Grossbettlingen, Fed. Rep. of Germany, assignor to Gebhard Balluff, Fabrik feinmechanischer Erzeugnisse, Neuhausen, Fed. Rep. of Germany**

**Filed Feb. 27, 1980, Ser. No. 125,216**
**Claims priority, application Fed. Rep. of Germany, Mar. 8, 1979, 2909048**
**Int. Cl.³ H05K *5/00***
**U.S. Cl. 361—331** **8 Claims**

1. An electrical switch comprising a holding part (10) and a control part (14) mounted at said holding part by means of an attachment part (12), the control part (14) and the attachment part (12) defining together a cube being divided along a plane of division (56) which forms angles of 45° with the adjacent edges of the cube, the control part (14) having a housing (60) with a front wall (74) defining an operative side of said control part and four adjacent side walls embracing an installation cavity for accommodating a sensor element (76, 78) and electric circuitry means (80) connected thereto, said holding part (10) having a front side (22) adjacent to said attachment part (12) which is mounted such that it is pivotable about a first axis (58) perpendicular to said front side (22), said control part (14) being disposed transposably on the attachment part (12) in such a way that it may be turned relative to the attachment part about a second axis (54*a*) forming an angle of 45° with said first axis (58) so that the control part (14) is mountable in several positions relative to said holding part (10) such that in a first position said front wall (74) is turned away from the holding



part (10) and in further positions it extends parallel to said first axis (58), the improvement comprising said plane of division (56) being offset with regard to the diagonal plane of the cube such that the volume of the control part (14) is substantially higher than that of the attachment part (12), said sensor element (76, 78) and said electric circuitry means (80) connected thereto being completely disposed within the installation cavity of the housing (60) of said control part (14), and a casting resin at least partially filling said installation cavity at least partially to embed said sensor element and said electric circuitry means.

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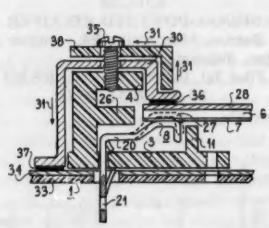
**4,314,311**

## PLUG-IN CARD SUPPORT PROVIDING ELECTRIC AND THERMAL CONNECTIONS

**Bruno Seytre, and Herve Bricaud, both of Suresnes, France, assignors to Socapex, Suresnes, France**

**Filed Apr. 8, 1980, Ser. No. 138,319**
**Claims priority, application France, Oct. 26, 1979, 79 26613**
**Int. Cl.³ H05K *7/20***
**U.S. Cl. 361—386** **3 Claims**



1. A plug-in card support providing electrical and thermal connections, comprising:

a common flat base comprising an insulating layer and a base heat sink, forming a heat conduction cooling unit,

a strip connector on said base and having groove means therein for receiving one edge of a circuit card having on one side an electric circuit and on the other side a heat-sink,

the two opposite internal faces of said groove means carrying respectively an electrical contact having elasticity and a thermal contact,

the various elements being positioned and sized so as to create a bearing force between an inserted circuit card heat sink and the thermal contact produced by a bearing

force between said card circuit and the strip connector electrical contact,

a thermal conductor coupling element coupling the thermal contact with said heat conduction cooling unit, the coupling element being supported by the strip connector, and

fixing means on said support for providing secure thermal and electrical contact.

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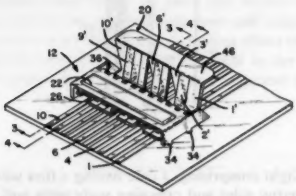
## 4,314,312
## PROGRAMMING MEANS

**William L. Donmoyer, Noblesville, Ind., and Jon A. Fortuna, Mechanicsburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.**

**Filed Apr. 14, 1980, Ser. No. 139,911**
**Int. Cl.³ H05K 1/18**
**U.S. Cl. 361—400** **6 Claims**



1. Programming means for establishing a predetermined circuit selected from a plurality of possible circuits, said programming means comprising:

a circuit board having at least three side-by-side circuit board conductors on one surface thereof,

a conductive connector clip mounted on said one surface, said clip comprising a clip bar having integral mounting means extending therefrom, said clip being mounted on said circuit board with said clip bar extending transversely of, and being spaced from said circuit board conductors,

a plurality of individual spring members integral with said clip bar and extending towards said one surface of said circuit board, each of said spring members being in alignment with, and resiliently biased towards, one of said circuit board conductors, and

removable insulating program control means between said springs and a number of said circuit board conductors, at least two of said spring members being in electrical contact with their associated circuit board conductors,

said insulating program control means comprising a plurality of side-by-side individual insulating members, each of said members being positioned between one of said circuit board conductors and its associated spring member and serving to insulate each circuit board conductor from its associated spring member, said individual insulating members being individually movable from between said circuit board conductors and said spring members whereby,

said at least two circuit board conductors are selectively connected to each other.

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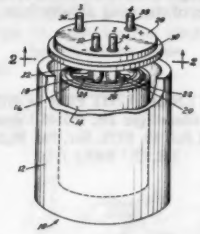
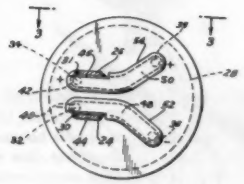
## 4,314,313
## SINGLE AND DUAL LOW INDUCTANCE CAPACITOR AND HEADER THEREFOR

**William H. Elias, Six Mile, and Harold M. Granger, Greenville, both of S.C., assignors to Sangamo Weston, Inc., Norcross, Ga.**

**Filed Sep. 10, 1979, Ser. No. 74,175**
**Int. Cl.³ H01G 9/00**
**U.S. Cl. 361—433** **28 Claims**

1. A capacitor header comprising: a header body; first terminal means carried by said header body and extending therefrom, said first terminal means including a first terminal portion noncoextensive with the remainder of said first terminal means spaced a predetermined distance from and parallel to one side of said header body and extending therefrom, said second terminal means including a second terminal portion spaced substantially said predetermined distance from and parallel to said one side of said header body and to said first





terminal portion of said first terminal means, sections of each of said first and second terminal means extending through said header body to form a pair of connecting means on the opposite side of said header body.

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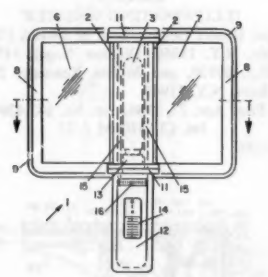
## 4,314,314
## ELECTRICALLY ILLUMINATED MIRROR

**Otto Hübner, Mauerkircher Strasse 199, Herzog Park, 8000 Munchen 81, Fed. Rep. of Germany**

**Filed May 30, 1980, Ser. No. 155,129**
**Int. Cl.³ F21V 7/04**
**U.S. Cl. 362—32** **10 Claims**



1. In an illuminated mirror device that includes a pair of spaced mirrors each mounted to be selectively pivotable, and an electrically energized source of light for illuminating the person using the pair of mirrors,

the improvement comprising, in combination: an elongated translucent tube surrounding an electrically energized source of light;

a pair of dished wings arranged to be selectively pivotable about the longitudinal axis of said translucent tube, and both being swingable between a closed position and an open planar position, a mirror mounted in the dished

portion of each wing and exposed for viewing when the wings are in open position; and

each wing having light conducting character for guiding light from a region adjacent the translucent tube to the terminal edges of the wing distally from said translucent tube.

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**4,314,315**

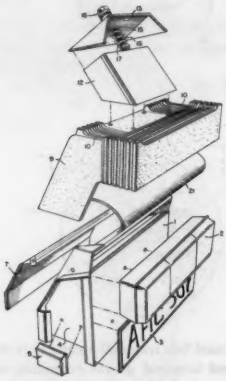
**REAR LIGHT UNIT FOR LORRIES**

**Kjell F. Ohlson, Tallmovägen 2B, 752 45 Uppsala, Sweden**

**Filed Jul. 18, 1979, Ser. No. 58,558**

**Int. Cl.³ B60Q *1/00***

**U.S. Cl. 362—80** **11 Claims**



1. A holding unit for a vehicle comprising mounting means for mounting of at least one vehicle light and at least one vehicle number plate,

climbing means attached to said mounting means for facilitating climbing upon said vehicle, and

resilient suspension means attached to said climbing means for suspending said climbing means and said mounting means from said vehicle.

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**4,314,316**

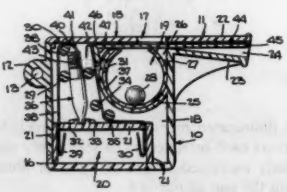
**ILLUMINATING WHISTLE**

**Leona Gertler; Robert Gertler, both of 23-10A CPL. Kennedy St., Bayside, N.Y. 11360; Dietmar Nagel, 147 South Rd., Chester, N.J. 07930, and Melvin Kennedy, 22 Lynn Ct., Hampton Bays, N.Y. 11946**

**Filed Apr. 21, 1980, Ser. No. 142,420**

**Int. Cl.³ H04M *1/22***

**U.S. Cl. 362—86** **20 Claims**



1. An apparatus for providing illumination comprising:

means for orally producing the forcible passage of air;

means for providing illumination; and

means for energizing the illuminating means in response to the forcible passage of air comprising non-conductive means having a first portion responsive to the forcible passage of air and a second portion for completing an electrical circuit for the illuminating means.

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**4,314,317**

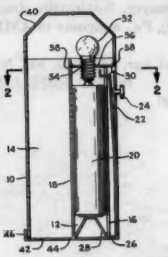
**FLASHLIGHT**

**Jerry A. Robson, 76 Sherman Ave., Mansfield, Ohio 44906**

**Filed Jan. 23, 1980, Ser. No. 114,678**

**Int. Cl.³ F21L *21/00***

**U.S. Cl. 362—189** **4 Claims**



1. A flashlight comprising: a case having a first section with opposing narrow sides and opposing wide sides and having a bottom and a top; a pair of fins respective members of which project into said chamber towards each other from opposite wide sides of said case, said fins being spaced from one narrow side of said case to retain a battery between said one narrow side and said fins; a lamp supported adjacent the upper end of said internal chamber in position for its terminal to contact the upper terminal of the battery retained in said internal chamber; and a strip of conductive, flexible metal extending lengthwise of said internal chamber between said fins and the other one of said narrow sides, said strip having a first leg passing between said fins with an upwardly bent portion supported adjacent said bottom of said chamber to support the battery, and having a second leg adjacent the top of the battery and extending laterally inwardly between said fins for contact with a side portion of said lamp; and means for bending said flexible metal strip inwardly to bring said second leg of said strip against the base of the lamp to turn the lamp on.

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**4,314,318**

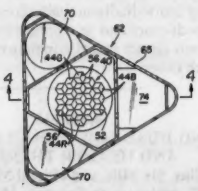
**LIGHT-REFLECTING DEVICE**

**James Dana, 102 Browns Rd., Nesconset, N.Y. 11767**

**Filed Sep. 18, 1980, Ser. No. 188,357**

**Int. Cl.³ F21V *11/00***

**U.S. Cl. 362—240** **6 Claims**



1. A device for beaming a resultant color light to a target which is a function of the mixing of red, blue, and green light sources comprising, in combination, red, blue, and green light sources circumferentially spaced 120 degrees apart, and a plurality of light-reflecting members in facing relation to said light sources operatively effective to beam light impinging thereon from said light sources to said target along closely parallel paths to thereby contribute to a visually-perceived color which is said resultant mixture of said red, blue, and

green lights, each said light-reflecting member consisting of a body having a vertically oriented central axis, a cooperating arrangement of three rectangularly shaped mirrors each disposed in facing relation to one said light source at an angular orientation in relation thereto selected to reflect light from said source impinging thereon along a path parallel to said body central axis, said long dimension of each said rectangular mirror being disposed at a perpendicular orientation to said body central axis and subtending a circumferential extent of 120 degrees, and said three mirrors being supported on an upper end of said body with the uppermost three corners of said mirrors joined at a common location and the two sides diverging outwardly therefrom of each said mirror being joined to said corresponding two sides of each of said other two mirrors to thereby form for each mirror two ridges in uppermost locations at the juncture of said sides in joined relation to each other, whereby said ridges of each said mirror confine for impingement thereon only the light from said source in facing relation thereto such that said cooperating effect of said plural light-reflecting members is to reflect light in the colors red, blue, and green along paths in closely adjacent and parallel relation.

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**4,314,319**

## ADJUSTABLE LAMPS

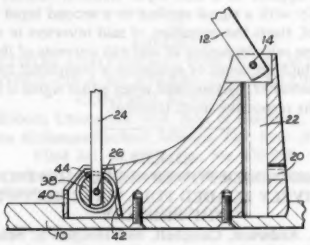
**John V. Terry, Wasperton House, near Warwick, Warwickshire, England; Raymond M. Terry, Newbold House, Newbold-on-Stour, Warwickshire, England, and Ian A. Atkins, Wychbold, England, assignors to John Victor Terry, Warwickshire and Raymond Michael Terry, Newbold-one-Stour, both of, England**

**Filed Jul. 12, 1979, Ser. No. 56,964**

**Claims priority, application United Kingdom, Aug. 26, 1978, 34780/78**

**Int. Cl.³ F21V *21/18***

**U.S. Cl. 362—287** **1 Claim**




1. A lamp comprising a base, an arm pivoted to the base and carrying a lamp housing at its free end, and a link which supports the arm and which is also pivoted to the base and to a member having a sliding frictional connection with the arm, so that the points at which the arm and link are pivoted to the base, together with a connection point of the link and arm, form the apices of a triangle, wherein the improvement comprises a torsion spring which is wound around the axis of a pin on which the link is pivoted to the base, the link, when holding the arm upright, having a lost motion connection with the spring, and the spring, when the link and arm are swung to take up the lost motion connection, being arranged to apply torque to the link to resist further movement of the link and arm toward a more horizontal position, and to assist in returning the link and arm from such a more horizontal position.

**4,314,320**

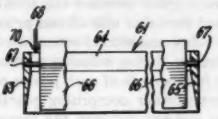
## MEANS INCLUDING A LIGHT DISTRIBUTION LOUVER FOR THE PROTECTION OF LIGHTING FIXTURES

**William Wolar, 59 Fremont Rd., North Tarrytown, N.Y. 10591**

**Division of Ser. No. 956,104, Oct. 30, 1978. This application Apr. 14, 1980, Ser. No. 139,838**

**Int. Cl.³ H02B *13/04***

**U.S. Cl. 362—342** **8 Claims**




1. A louver for distribution of light from a lighting fixture comprising four side walls forming a rectangular frame, a plurality of diamond shaped vanes each pivotally carried by two of said side walls and angularly adjustable about the axis of the pivots relative thereto, and a control arm pivotally coupled to each of said vanes at points spaced from the first said pivots for simultaneous adjustment of said vanes.

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**4,314,321**

## OZONIZER FEEDING DEVICE

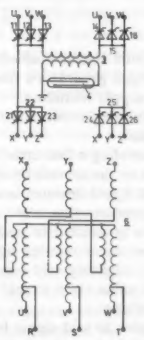
**Josef Galliker, Wettingen, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland**

**Filed Apr. 25, 1980, Ser. No. 143,554**

**Claims priority, application Switzerland, Apr. 30, 1979, 4031/79**

**Int. Cl.³ H02M *5/00***

**U.S. Cl. 363—10** **4 Claims**



1. An ozonizer power feeding device comprising:

a multiphase power source having at least one terminal for each phase;

a thyristor circuit coupled to the terminals of said source, said thyristor circuit comprising at least two thyristors for each phase connected at one side thereof in an anti-parallel configuration to the respective terminal of said source;

a transformer having at least one primary coil coupled to the other sides of said anti-parallel connected thyristors and a

secondary coil adapted to be connected to an ozonizer for feeding power to said ozonizer;

a joint control unit coupled to each of said thyristors for controlling the conduction time thereof in dependence on the waveforms provided at the terminals of said source;

said transformer comprising a single primary coil having two sides;

said thyristor circuit comprising,

a first set of respective pairs of anti-parallel connected thyristors coupled between the terminals of said power source and one side of said primary coil, and

a second set of respective pairs of anti-parallel connected thyristors coupled between the terminals of said power source and the other side of said primary coil;

wherein the first and second sets of thyristors are provided for switching during selected portions of positive and negative half-periods of each power phase; and

a power transformer comprising plural zigzag connected windings inserted between the terminals of said multiphase power source and the anti-parallel connected thyristors.

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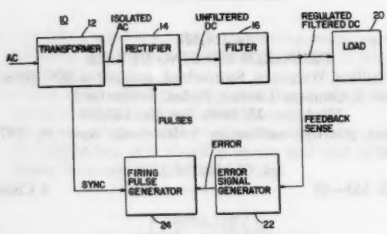
**4,314,322**

## THREE PHASE REGULATED SUPPLY WITH RIPPLE CURRENT REGULATION

**Robert J. Plow, Avon Lake, and Jerry C. Rader, Grafton, both of Ohio, assignors to Reliance Electric Company, Cleveland, Ohio**

**Filed Mar. 6, 1980, Ser. No. 127,869**
**Int. Cl.³ H02M *1/14***
**U.S. Cl. 363—46** **21 Claims**




1. A ripple regulation circuit adapted for use in a multiphase regulated supply which generates a filtered d.c. output signal having ripple, said supply including:

(i) adjustable regulating means for regulating the value of said output signal;

(ii) means for generating a first error signal having a magnitude dependent on the amount by which an actual value of said d.c. output signal deviates in a predetermined direction from a reference value; and

(iii) control means connected to said regulating means and responsive to an error control signal equal to said first error signal for adjusting said regulating means to maintain said actual value equal to said desired value;

said circuit comprising:

(a) means responsive to said ripple for generating a second error signal having an amplitude dependent on the amount by which the actual d.c. value of said ripple deviates in a predetermined direction from a desired d.c. value of said ripple; and

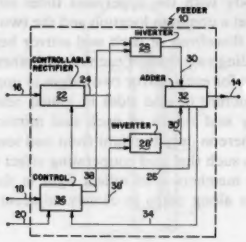
(b) means responsive to said first and second error signals for selecting said error control signal as being equal only to the larger amplitude one of said first and second error signals, said control means adjusting said regulating means when said error control signal is equal only to said second error signal to thereby maintain said ripple d.c. value substantially equal to said desired value.

**4,314,323**

## FEEDER FOR RAPID SHUTDOWN FOR SAFETY DEVICES OF NUCLEAR REACTORS

**Ruggero Conti, and Franco Imperiali, both of Rome, Italy, assignors to Comitato Nazionale per l'Energia Nucleare, Rome, Italy**

**Filed Dec. 20, 1978, Ser. No. 971,601**
**Claims priority, application Italy, Dec. 21, 1977, 52311 A/77**
**Int. Cl.³ H02M *7/515***
**U.S. Cl. 363—71** **4 Claims**




1. A feeder circuit for use in supplying current from its output to rod-supporting electromagnet means of a nuclear reactor, said feeder circuit comprising, in combination:

(a) a controllable rectifier for providing a regulated d.c. output from an a.c. input of network frequency;

(b) at least two substantially identical inverters coupled to said controllable rectifier for inverting said d.c. output to an alternating current at a frequency higher than said network frequency and for elevating the voltage thereof;

(c) a sequence control circuit coupled to said inverters for causing the exit currents of said inverters to be dephased with respect to each other by a fixed amount equal to 180°/n, wherein n is the number of said inverters; and

(d) an adder coupled to said inverters for first rectifying and then adding said exit currents to provide a current sum constituting the output current of said feeder circuit;

(e) wherein said sequence control circuit, in response to a signal applied to a first input terminal thereof simultaneously with a signal applied to a second input terminal thereof, starts the operation of said inverters in sequence to cause said dephasing of said exit currents of the inverters, which sequence of operation is completed for a cycle and thereafter discontinued when either signal is removed from its respective input terminal.

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**4,314,324**

## TRANSFORMER POWER SUPPLY HAVING AN INDUCTIVELY LOADED FULL WAVE RECTIFIER IN THE PRIMARY

**Emmett R. Anderson, Campbell, and Douglas S. Schatz, San Jose, both of Calif., assignors to Energy Research Associates, Campbell, Calif.**

**Filed Nov. 8, 1979, Ser. No. 92,280**
**Int. Cl.³ H02P *13/24***
**U.S. Cl. 363—90** **9 Claims**

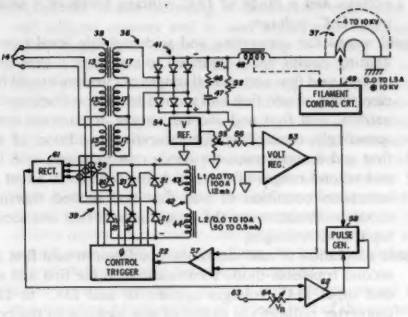
1. In a transformer power supply:

transformer means having a primary winding means for connection to a source of alternating electrical power and having a secondary winding means inductively coupled to said primary winding means for connection to a load for transforming alternating electrical power from the source to the load at the frequency of the source;

full wave rectifying means having an input for connection in series with said primary winding of said transformer means for supplying input alternating electrical power at the frequency of the source to said full wave rectifying means and having an output for supplying output rectified current on each half cycle of the input power in response

to the application of input alternating current to said input of said full wave rectifying means from the source;

inductive load means for connection across said output of said full wave rectifying means for inductively loading said full wave rectifying means and hence for inductive loading of said primary winding; and




wherein the load to be connected to the output of said secondary winding of said transformer means has a predetermined resistance characteristic and wherein the inductance of said inductive load means for said full wave rectifying means exceeds the critical inductance value found from the relation:

$$\frac{L}{R_{Lref}} > \frac{\tau}{2n}$$

where L is the critical inductance, $R_{Lref}$ is the load resistance to be connected to said secondary winding of said transformer means as reflected through said transformer means into said primary winding means, $\tau$ is the period of the electrical power supplied to said primary winding means from the source, and n is the number of phases of the power supplied from the source to said transformer means.

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**4,114,325**

## METHOD AND CIRCUIT FOR PULSE-WIDTH CONTROL OF A BILATERAL DIRECT CURRENT CONTROL ELEMENT

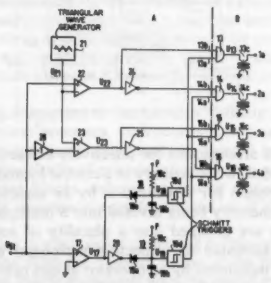
**Jürgen Siebert, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Jul. 18, 1980, Ser. No. 170,990**

**Claims priority, application Fed. Rep. of Germany, Jul. 30, 1979, 2930920**

**Int. Cl.³ H02P *13/18***

**U.S. Cl. 363—98** **9 Claims**




3. A circuit arrangement for controlling a bilateral direct current control bridge of the type having four bridge arms, each bridge arm having an electronic switching element electrically disposed therein for conducting a load current to a load which is connected between respective diagonally disposed pairs of bridge arms, the electronic switching elements each being of the type which will conduct current in response to an energizing signal, the circuit further comprising;

a. energizing means for applying first and second energizing pulse signals respectively to first and second electronic switching elements in an associated first diagonal pair of bridge arms, said first and second pulse signals being out of phase with respect to one another, the load current being responsive in amplitude to a time interval during which the first and second electronic switching elements are simultaneously conductive.

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**4,314,326**

## RECTIFYING CIRCUIT WITH ZERO CORRECTION

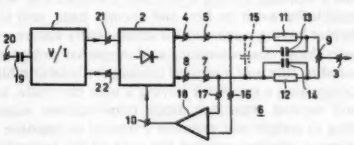
**Robert E. J. Van de Grift, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Mar. 31, 1980, Ser. No. 135,968**

**Claims priority, application Netherlands, Apr. 2, 1979, 7902545**

**Int. Cl.³ H02M *7/217***

**U.S. Cl. 363—127** **14 Claims**

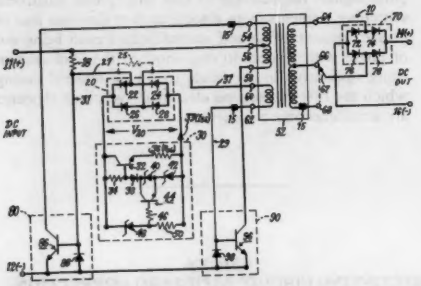



1. A rectifying circuit comprising a first and a second circuit input for receiving alternating currents applied in push-pull, first and second current circuits connected between the first and the second circuit inputs respectively and a power supply terminal and provided with a current mirror circuit which intercouples the current circuits for coupling the current in the one current circuit to the other current circuit with a current gain of substantially unity depending on the polarity of the difference of the currents in the current circuits, means coupling the first and the second circuit inputs to a circuit output via a third and a fourth current circuit respectively, to derive at said output a rectified alternating current, said third and fourth current circuits each comprising the main current paths of a transistor having current output electrodes coupled to the circuit output, and means for reducing a d.c. unbalance between the currents from the third and the fourth current circuits to substantially zero comprising, a current comparison device having a first input connected to the current output electrode of the third current circuit, a second input connected to the current output electrode of the fourth current circuit and a first output connected to the circuit output, said current comparison device including at least one control output connected to one of the said current circuits and further comprising two current transfer circuits included between the comparison device first and second inputs respectively and the first output, integrating means coupled to said current transfer circuits, and a differential amplifier having two input terminals coupled to said integrating means and an amplifier output connected to the control output for supplying a cmpensation current as a function of the d.c. unbalance between the means values of the said currents.

## 4,314,327
## TRANSISTOR DRIVE CONTROL FOR A MULTIPLE INPUT D.C. TO D.C. CONVERTER

Robert P. DePuy, Cherry Hill, N.J., assignor to General Electric Company, Philadelphia, Pa.

Filed Nov. 17, 1980, Ser. No. 207,586
Int. Cl.[3] H02M 3/335
U.S. Cl. 363—142 6 Claims



1. In a D.C. to D.C. voltage converter adapted for energization by various input D.C. voltages each having different D.C. voltage levels relative to each other and each having a positive and negative potential, said positive potential being connected to a center-tap of a primary winding of a saturable transformer, said saturable transformer having a first secondary or base drive winding having a first and a second end and a second secondary winding having a first and a second end with a tap positionable between its first and second ends, said saturable transformer having a core with a substantially square magnetic hysteresis loop characteristic, said negative potential being connected to first and a second transistor diode combinations, each comprising a transistor having a base electrode, said first and said second transistor diode combinations sequentially operating to couple said negative potential to opposite ends of said primary winding causing the core of the saturable transformer to be sequentially excited into its positive and its negative saturation conditions, said first and second transistor diode combinations being controlled by a base drive circuit having a starting resistor with a first end connected to said positive potential and a second end, said base drive circuit being arranged in series with the transistor diode combinations and said base drive winding of said saturable transformer, said base drive winding having an A.C. voltage across its first and second ends representative of the D.C. voltage present at a said primary winding, said second end of said base drive winding being coupled to said base electrode of said second transistor diode combination, said base drive winding voltage experiencing a rapid reversal as the transformer is excited into its negative and positive saturation conditions, said rapid reversal causing the base drive circuit to sequentially render conductive and non-conductive the first and the second transistor diode combinations, said sequential conduction of said first and second transistor diode combinations allowing said transformer to be sequentially driven into its saturation conditions, which, in turn, develops a time-varying signal at the second secondary winding of said transformer which is rectified by an A.C. to D.C. rectifier to develop a desired D.C. output voltage, said base drive circuit further comprising:

means for converting said A.C. voltage of said base drive winding into a representative D.C. output voltage, said means for converting having a first end coupled to said first end of said base drive winding and a second end coupled to said second end of said starting resistor and to said base electrode of said first transistor diode combination, said D.C. output voltage of said means for converting being coupled across a multiple level current limiting circuit;

said multiple level current limiting circuit developing a current representative of said coupled D.C. output voltage, said current having a first and a second range representative of a first and a second range of said coupled D.C. output voltage, said first and second ranges of said coupled D.C. output voltage being respectively representative of a range of D.C. voltage levels of a first input D.C. voltage and a range of D.C. voltage levels of a second input D.C. voltage;

said means for converting and said multiple level current limiting circuit being arranged to supply as a base drive current said first and second ranges of currents to said base electrodes of said first and second transistor diode combinations, said first and second ranges of currents correspondingly controlling the saturation condition of said first and second transistor diode combinations, said first and second ranges of currents being such as to adapt the saturation condition of said first and second transistor diode combinations to the ranges of said first and second input D.C. voltages;

said adaptation of said saturation condition of said first and second transistor diode combinations to the first and second input D.C. voltages applied to said D.C. to D.C. converter reduces the extent of any increase to the commutational losses for each of the first and second transistor diode combinations that would otherwise occur for major and minor positive increases in the D.C. voltage levels of the applied first and second D.C. voltages.

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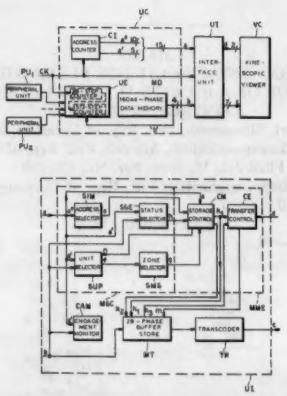
## 4,314,328
## INFORMATION EXTRACTOR FOR THE SELECTIVE VISUALIZATION OF DATA STORED IN A MONITORING MEMORY

Massimino Di Donato, Meda-Milano, and Attilio Filisetti, Cornaredo-Milano, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Aug. 27, 1979, Ser. No. 70,035
Claims priority, application Italy, Aug. 29, 1978, 27086 A/78
Int. Cl.[3] G06F 3/14, 3/04, 13/00, 7/02
U.S. Cl. 364—900 10 Claims



1. A circuit arrangement for selectively extracting information from a read/write memory at a central location of a data-processing system for visualization by an associated display device, said memory being divided into a multiplicity of subzones which are grouped into a plurality of zones at least temporarily allocated to respective peripheral units of the system to be monitored by an operator at said central location and which are periodically scanned in a series of time slots, marked by the stepping of an address counter by timing means generating said time slots, for the reading and writing of data

pertaining to the corresponding peripheral units, said circuit arrangement comprising:

a buffer store with input connections to said memory and with a storage capacity for data contained in any one of said zones;

selection means including a register loadable by the operator with a designation of a chosen peripheral unit;

identification means including a comparator connected to said address counter and to said register for emitting a coincidence signal upon the scanning of a zone of said memory allocated to the designated peripheral unit, said identification means further including a decoder connected to said address counter for detecting the address of a predetermined subzone of any zone carrying the designation of a respective peripheral unit to which such zone is temporarily allocated, said comparator being provided with an enabling input connected to said decoder for activation upon detection of the address of said predetermined subzone and being further provided with two sets of data inputs respectively connected to said register and to said memory for receiving from the latter the designation of the respective peripheral unit; and

transfer means responsive to said coincidence signal for commanding a transmission of at least part of the contents of the memory zone allocated to the designated peripheral unit via said buffer store to said display device.

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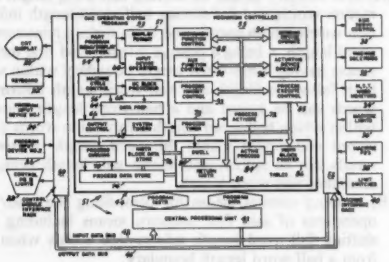
## 4,314,329
## METHOD AND APPARATUS FOR USING A COMPUTER NUMERICAL CONTROL TO CONTROL A MACHINE CYCLE OF OPERATION

**David W. Crewe, Halifax, England, and Stephen P. Hill-Harriss, Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio**

**Filed Feb. 4, 1980, Ser. No. 118,644**
**Int. Cl.³ G05B *19/18***
**U.S. Cl. 364—141** **20 Claims**



1. A method for executing machine processes using a control computer, said computer having a memory and generating constact period timing signals and process signals to initiate the machine processes during the execution of a machine cycle of operation, said control including a machine interface for receiving the states of input signals produced by condition sensing devices and transmitting output signals to actuate mechanisms to execute a process function, the method comprising the steps of:

(a) storing a program in the memory defining a number of independent processes, each process being uniquely identified by a process signal and represented by a series of instruction blocks of process information, a number of the instruction blocks defining an output signal to be produced in response to a predetermined set of states of input signals;

(b) storing a process signal generated by the control;

(c) recalling from the memory a first of the number of instruction blocks associated with the stored process signal in response to a first timing signal;

(d) testing the machine interface to detect the actual set of states of selected input signals defined by the first instruction block;

(e) comparing the actual states of the selected input signals with the predetermined set of states;

(f) transferring the output signal to the machine interface in response to the detected set of states of the selected input signals corresponding to the predetermined set of states;

(g) generating an error signal identifying the ones of these selected input signals having actual states different from the predetermined states;

(h) iterating steps (c) through (g) for each of the number of instruction blocks stored in association with the first stored process signal; and

(i) iterating steps (b) through (h) for each of the process signals generated by the control computer.

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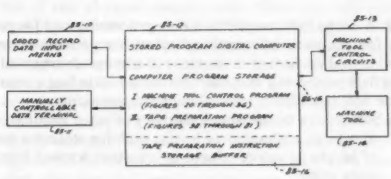
## 4,314,330
## MACHINE TOOL DATA SYSTEM

**Kenneth L. Slawson, Depew, N.Y., assignor to Houdaille Industries, Inc., Ft. Lauderdale, Fla.**

**Division of Ser. No. 421,103, Dec. 3, 1973, Pat. No. 4,150,427, which is a division of Ser. No. 150,637, Jun. 7, 1971, Pat. No. 3,816,723, which is a continuation-in-part of Ser. No. 744,392, Jul. 12, 1968, Pat. No. 3,634,662, which is a continuation-in-part of Ser. No. 652,968, Jul. 12, 1967, abandoned. This application Feb. 23, 1979, Ser. No. 14,582**
**The portion of the term of this patent subsequent to Jun. 11, 1991, has been disclaimed.**
**Int. Cl.³ G06F *15/46*; B23Q *21/00*; G05B *19/42***
**U.S. Cl. 364—192** **28 Claims**


CODED RECORD DATA INPUT MEANS
STORED PROGRAM DIGITAL COMPUTER
COMPUTER PROGRAM STORAGE
I MACHINE TOOL CONTROL PROGRAM (FIGURES 7A THROUGH 7G)
II TAPE PREPARATION PROGRAM (FIGURES 8A THROUGH 8J)
TAPE PREPARATION INSTRUCTION STORAGE BUFFER
MACHINE TOOL CONTROL CIRCUITS
MACHINE TOOL
MANUALLY CONTROLLABLE DATA TERMINAL

2. In a computer system,

(a) a manually controllable input device operable to produce coded input signals

as manually selected by an operator pertaining to successive blocks of new machine control data to be generated,

(b) said manually controllable input device being operable to produce coded input signals representing at least the following:

(1) a plural digit decimal number representing a displacement value relative to one of a plurality of machine axes (2) a coded "list" input signal, (3) a coded "delete" input signal, and (4) a coded "copy" input signal, and

(c) a stored program digital computer including a computer memory with memory locations for storing machine control data pertaining to the operation of a machine, said computer memory having a stored program therein, and said digital computer under the control of said stored program being responsive to said coded input signals to generate siad sucessive blocks of new machine control data in accordance therewith and to store said successive blocks of machine control data at said memory locations, said digital computer under the control of said stored program being operable: (1) to respond to said coded input signal representing a plural digit decimal number to generate a block of said new machine control data incorporating a displacement value relative to said one of a plurality of machine axes in accordance with said plural digit decimal number, (2) to respond to said coded "list" input signal to list all blocks of said machine control data in said memory locations, (3) to respond to said coded "delete" input signal to delete identified blocks of said

machine control data from said memory locations, and (4) to respond to said coded "copy" input signal to produce additional blocks of machine control data corresponding to respective identified blocks of said machine control data in respective memory locations.

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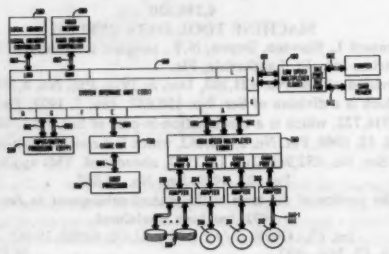
4,314,331

## CACHE UNIT INFORMATION REPLACEMENT APPARATUS

Marion G. Porter, Phoenix; Robert W. Norman, Jr., Glendale, and Charles P. Ryan, Phoenix, all of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 11, 1978, Ser. No. 968,048
Int. Cl.[3] G06F 9/30
U.S. Cl. 364—200 35 Claims



1. A cache unit coupled to a data processing unit for providing fast access to information fetched from a main store coupled to said cache unit in response to commands received from said data processing unit, each command including a command code and an address, said cache unit comprising:

a buffer store comprising a plurality of word locations organized into a plurality of levels, each for storing a number of blocks of words of said information fetched from said main store;

a directory for storing block addresses identifying the blocks of words stored within said buffer store levels, said directory further including a plurality of locations, each of said locations including a plurality of bit positions for storing level assignment signals identifying a next level within said buffer store into which new information fetched from said main store is to be placed;

address register means, said address register means containing a number of bit positions for storing in response to one of said commands an address and signals indicating the level from which a next instruction word of information is to be accessed by said data processing unit;

replacement circuit means for generating said level assignment signals in a predetermined pattern, said replacement circuit means being coupled to said directory; and,

detection circuit means coupled to said address register means, to said replacement circuit means, to said processing unit and to said directory, said detection means being operative to compare a first portion of said address of each of said commands received from said processing unit having a command code specifying a read type operation with a corresponding portion of said address stored in said address register means and said signals indicating said level with said level assignment signals read out from one of said plurality of directory locations in response to said first portion of said command address, said detection circuit means being operative to generate an output control signal indicating that the read command specifying a request for new information conflicts with the processing unit's accessing of information specified by said address register means, said directory being conditioned by said output control signal to prevent assigning the level specified by said level assignment signals generated by said replacement circuit means thereby altering said predetermined pattern.

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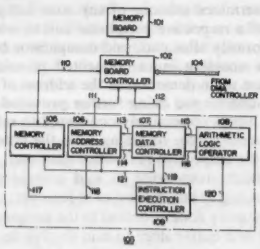
4,314,332

## MEMORY CONTROL SYSTEM

Yukio Shiraogawa, Kunitachi, and Keizo Aoyagi, Fuchu, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 13, 1979, Ser. No. 20,021
Claims priority, application Japan, Mar. 15, 1978, 53-29404
Int. Cl.[3] G06F 9/06
U.S. Cl. 364—200 8 Claims




1. A memory control system for a data processing system in which the length of an access unit to a memory can be different from the lengths of information words which can include data, addresses, and instructions and operands processed in an arithmetic control apparatus, and combinations thereof, and in which an address boundary for effecting a read/write operation with respect to the memory of information words having a half-word length and a full-word length is processed comprising:

(A) first memory means for storing full-word length information words and for storing half-word length information words which correspond to 2n times a minimum unit word length, n being a postive integer, said first memory means having a full-word length boundary within which both full-word length and half-word length information words can be stored and a half-word length boundary within which half-word length information words can be stored and across which full-word length information words can be stored, said access unit length being said minimum unit word length;

(B) memory control means for controlling the read/write operations of said first memory means including cross shifting full-word length information words when read from a half-word length boundary;

(C) memory data control means comprising,

(a) an instruction buffer register for temporarily storing a half-word length information word or a full-word length information word from said first memory means through said memory control means,

(b) an instruction register for storing an instruction from an information word in the instruction buffer register,

(c) a base register designating register for storing data from an information word in the instruction buffer register, said data designating a base register for storing a base modification value for base-modifying an address,

(d) first and second switching circuits for controlling a flow of information words from the instruction buffer register, and

(e) a memory data register for temporarily storing an information word switched through one of said first and second switching circuits;

(D) arthmetic operating means bi-directionally coupled to said memory data control means for making computations from information in information words supplied from said memory data register and for supplying the results of

computations to said first and second switching circuits, said base register designating register and said instruction register;

(E) memory address control means comprising,

(a) a memory address register for storing address information of an information word from said arithmetic operating means,

(b) an instruction address register for storing instruction address information of an information word from said arithmetic operating means, and

(c) switching means for switching the output signal from the instruction address register to said memory control means; and

(F) instruction execution control means coupled to said memory control means, said memory address control means, said memory data control means and said arithmetic operating means for executing an instruction in an information word fetched from said first memory means and for supplying a control signal to said memory control means, said memory address control means, said memory data control means and said arithmetic operating means.

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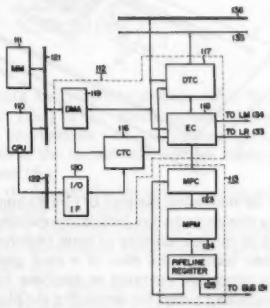
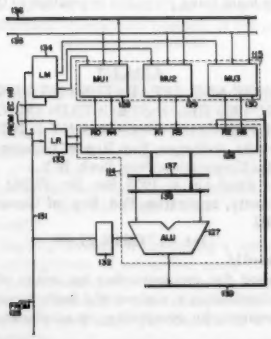
## 4,314,333
## DATA PROCESSOR

**Shigeki Shibayama; Kazuhide Iwata, and Nobuo Okuda, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan**

**Filed Mar. 20, 1979, Ser. No. 22,353**
**Claims priority, application Japan, Mar. 28, 1978, 53-34807**
**Int. Cl.³ G06F *13/06, 9/06, 7/00***
**U.S. Cl. 364—200** **7 Claims**




1. An auxiliary processing system for use in a data processing system wherein a host computer selectively transfers to the auxiliary processing system host control signals for controlling the operation of the subsystem and processing operations to be performed on associated data stored in a main memory coupled to the host processor and wherein the auxiliary processing subsystem performs the transferred operations on the associated data and returns the processing results to the host computer, the auxiliary processing system comprising:

a plurality of physical memory units, each of said physical memory units including a series of addressable storage locations;

an arithmetic and logic unit means;

a register file including a plurality of addressable pairs of associated address and data registers coupled to said arithmetic and logic unit means, each of said physical memory units being coupled to a different one of said pairs of registers for the transfer of data and associated addresses between said arithmetic and logic unit means and said physical memory units;

a microprogram memory for storing a set of microinstructions, each of said microinstructions including a set of ALU control signals for designating an operation to be performed by said arithmetic and logic unit means, a set of register control signals for designating at least two of said pairs of associated address and data registers in said register file to be used to transfer data between said arithmetic and logic unit means and said physical memory units associated with the designated register pairs during the performance of said designated operation, and a set of memory control signals to be used to control the operation of said associated physical memory units during the execution of said designated operations;

means for transferring data between said main memory and one of said physical memory units other than said associated physical memory units and for controlling the storing and accessing of data stored in said physical memory units in response to said host control signals from said host computer, said one of said physical memory units being selectively designated by said host control signals;

first control means for receiving said set of memory control signals and applying said received set of memory control signals selectively to said physical memory units associated with said designated register pairs under the control of said host control signals for controlling said associated physical memory units to enable the transfer of data to and from said associated physical memory units and the data registers coupled thereto whenever said ALU control signals designate data transfers between said physical memory units and said arithmetic and logic unit means; and

second control means for converting said register control signals into the addresses of particular registers in said register file selected by said host control signals and for controlling the transfer of data through said selected data registers between said arithmetic and logic unit means and said associated physical memory untis coupled to said slected data registers whereby the auxiliary processing subsystem multiplexes among said pluralities of physical memory units and register pairs to dynamically select physical memory units and data registers to be used during the execution of said microinstructions.

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## 4,314,334
## SERIAL DATA COMMUNICATION SYSTEM HAVING SIMPLEX/DUPLEX INTERFACE

**John W. Daughton, Fairport, N.Y.; Kenneth Gillett, Redondo Beach; Frank Nelson, Sherman Oaks, both of Calif., and Stephen P. Wilczek, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Division of Ser. No. 829,012, Aug. 30, 1977, Pat. No. 4,170,791.**
**This application Mar. 26, 1979, Ser. No. 23,571**
**Int. Cl.³ G06F *3/04***
**U.S. Cl. 364—200** **17 Claims**

1. A data communication system comprising:

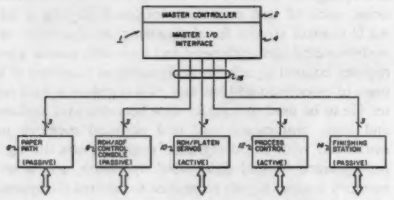
a. a master unit including a programmable controller, mem-

ory storage means for storing programs and command and data bytes, and an address and data bus,

b. interface means connected to said address and data bus of said master unit and including:

1. means connected to said data bus for receiving and storing a command byte,
2. means connected to said data bus for receiving and storing an output data byte,
3. means for transmitting said command and output data bytes along a first communication path, and
4. means for storing an input data byte, said input data byte storing means connected to receive data along a second communication path, and connected for providing said received data to said data bus of said master unit, and

c. a remote unit connected to receive said command and




output data bytes from said first communication path and for transmitting input data bytes to said input data byte storing means of said interface means along said second communication path,

said interface means including decoder means coupled to said address bus for generating a simplex/duplex bit comprising a portion of said command byte for initiating either a simplex mode of operation in said remote unit wherein data is read by said master unit from said remote unit or for initiating a duplex mode of operation in said remote unit wherein data is simultaneously read by said interface means from said remote unit and data is written into said remote unit by said interface means, and

said remote unit further comprising circuit means responsive to said simplex/duplex bit for responding in said simplex and duplex modes of operation.

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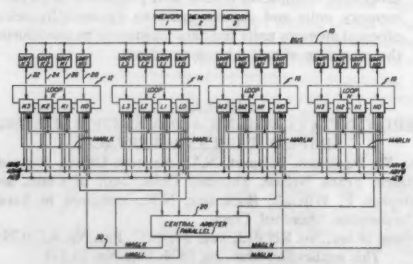
**4,314,335**

## MULTILEVEL PRIORITY ARBITER

**Louis D. Pezzi, Freehold Township, Monmouth County, N.J., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.**

**Filed Feb. 6, 1980, Ser. No. 118,879**
**Int. Cl.³ G06F *9/46***
**U.S. Cl. 364—200** **10 Claims**




1. A multi-level arbiter system for resolving contention between a plurality of requests for access to a shared facility comprising, in combination:

a plurality of loop arbiters each for awarding access to the shared facility to an external unit coupled thereto, each loop arbiter comprising, in combination;

(a) a plurality of request latches, each responsive to one externally generated access request signal from an external unit coupled thereto and desiring access to the shared facility, each request latch producing a unit request signal and a loop request signal;

(b) a priority resolution circuit responsive to each unit request signal for conditioning the loop arbiter to grant access to the shared facility to the unit having the highest priority of those units then producing a unit request signal upon receipt of externally generated loop grant signal; and

a central arbiter responsive to each said loop request signal from all said loop arbiters to produce a loop grant signal to the loop arbiter producing a loop request signal and having the highest priority among all said loop arbiter request signals present at that moment of time.

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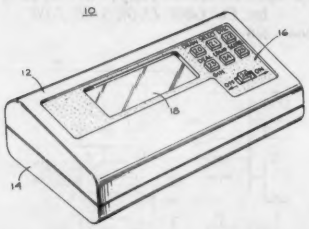
**4,314,336**

## ELECTRONIC CARD GAME SIMULATOR

**William L. Bernstein, Los Angeles, and Robert M. Del Principe, Hawthorne, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.**

**Filed Dec. 31, 1979, Ser. No. 108,880**
**Int. Cl.³ G06F *15/44***
**U.S. Cl. 364—411** **16 Claims**




1. A device for simulating the play of Gin Rummy comprising a housing; a display including indicia representing the cards in a single deck of cards; a plurality of input switches by which an operator may indicate the play of a card game; and an electronic data processor operated in response to the input switches and including means for simulating the play of a hand of Gin Rummy in opposition to the play of the operator, and means for causing the display to present a simulated game, including means for using the indicia to display the operator's hand and the hand being played in opposition to the play of the operator.

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**4,314,337**

## METHOD OF AND APPARATUS FOR GENERATING IMPROVED RECONSTRUCTION IMAGES IN COMPUTERIZED TOMOGRAPHY EQUIPMENT

**Günter Kowalski, Rellingen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Apr. 6, 1979, Ser. No. 27,552**
**Claims priority, application Fed. Rep. of Germany, Apr. 15, 1978, 2816462**
**Int. Cl.³ G01N *23/00***
**U.S. Cl. 364—414** **4 Claims**

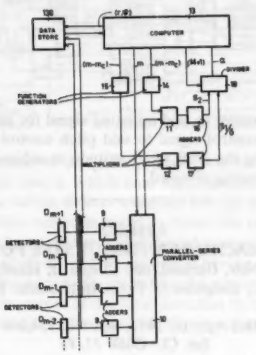
1. A method for reconstructing an image of a radiation absorption distribution in a plane of a body by means of computerized tomography comprising, in combination, the steps of:

irradiating a plane of the body, from different directions in the plane, with penetrating radiation by rotating a radiation source which emits a fan-shaped beam of the radiation about a centre of rotation;

utilizing an array of radiation detectors to measure the attenuation of the beam of radiation in the body;

determining a first intermediate value ($Z_m{}^1$) for each detector ($D_m$), which first intermediate value is proportional to an intermediate sum ($\phi_m$) obtained by summation of the measuring data ($Q(r_m, \phi_n)$) measured with the detector ($D_m$) in the various directions ($\phi_n$) and which intermediate sum further is proportional to goniometric functions $k_m$ and $l_m$, whose arguments are proportional to the difference between a variable detector number (m), which is representative of the position of the detector ($D_m$) in the array and a fixed preselected detector number ($m_c$) and to an angle ($\delta$) enclosed by the centres of two adjacent detectors in the array at the radiation source;

adding the first intermediate values from all of the detectors to form a first sum ($S_1$);




determining a second intermediate value for each detector number ($D_m$) ($Z^2{}_m$), which second value is proportional to the intermediate sum and the function $l_m$;

adding all of the second intermediate values to form a second sum ($S_2$);

dividing the first sum by the second sum to determine a third intermediate value ($r_c(\nu+1)$;

calculating a correction factor ($\alpha$), which is proportional to the third intermediate value and inversely proportional to the angle ($\delta$);

determining the position of the centre of roation from a number of the detector which is indicative of the position of the centre of rotation by adding the correction factor ($\alpha$) to a predetermined detector number; and

reconstructing an image of the absorption distribution utilizing the methods of convolution and back-projection based on the aforesaid determined position of the centre.

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**4,314,338**

## METHOD OF GENERATING SUBSURFACE CHARACTERISTIC MODELS

**Jean Suau, Clamart, France, and William Frawley, Ridgefield, Conn., assignors to Schlumberger Limited, New York, N.Y.**

**Continuation of Ser. No. 178,129, Sep. 7, 1971, abandoned. This application Mar. 12, 1979, Ser. No. 19,917**

**Int. Cl.³ G06F** *15/20*

**U.S. Cl. 364—422** **46 Claims**

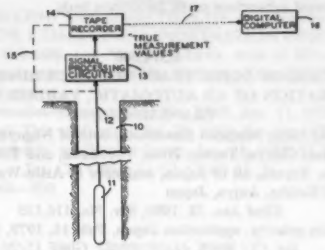
1. A well logging method of producing a representation of the vertical arrangement of subsurface earth formation beds with respect to a subsurface characteristic, which representation is substantially consistent with measurements of the characteristic taken in a well in the formation with a well logging device, comprising:

(a) deriving a set of initial well logging measurements from the measurements taken in the well with the well logging device over a given depth interval;

(b) selecting a trial variation of the subsurface characteristic with depth in the well;

(c) generating, by a computer, a set of new well logging measurements by applying the approximate response characteristic of the logging device to the trial variation of the subsurface characteristic;

(d) comparing, by a computer, the new well logging measurements to the initial well logging measurements and




generating, by a computer, an error function in accordance with said comparison, said error function reflecting the comparison taken over a substantial portion of said given depth interval; and

(e) modifying, by a computer, the trial variation in a manner which tends to minimize said error function to produce a visual or a stored record of said representation of the vertical arrangement of subsurface beds.

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**4,314,339**

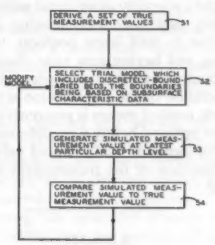
## METHOD OF GENERATING SUBSURFACE CHARACTERISTICS MODELS

**William E. Kenyon, Houston, Tex., assignor to Schlumberger Limited, New York, N.Y.**

**Continuation of Ser. No. 177,941, Sep. 7, 1971, abandoned. This application Mar. 12, 1979, Ser. No. 19,925**

**Int. Cl.³ G06F** *15/20*; **E21B** *47/00*

**U.S. Cl. 364—422** **39 Claims**


DERIVE A SET OF TRUE MEASUREMENT VALUES
SELECT TRIAL MODEL WHICH INCLUDES DISCRETELY-BOUNDARIED BEDS, THE BOUNDARIES BEING BASED ON SUBSURFACE CHARACTERISTIC DATA
MODIFY MODEL
GENERATE SIMULATED MEASUREMENT VALUE AT LATEST PARTICULAR DEPTH LEVEL
COMPARE SIMULATED MEASUREMENT VALUE TO TRUE MEASUREMENT VALUE

1. A well logging method of producing a representation mapping the relative arrangement of subsurface earth formation beds with respect to a subsurface characteristic measured with a well logging device, comprising:

(a) producing initial well logging measurements for particular depths in the formation derived from measurements taken in a well in the formation with the well logging device over a given depth interval;

(b) producing a trial variation of the subsurface characteristic, said trial variation varying in discrete steps corresponding to discretely-boundaried subsurface earth formation beds, said boundaries being based on measurements of the subsurface characteristic;

(c) generating, by a computer, a new well logging measurement for a particular depth level for which there is an initial well logging measurement, by applying the approxi-

mate response characteristic of the logging device to the trial variation of the subsurface characteristic;

(d) comparing, by a computer, the new well logging measurement at the particular depth level to the initial measurement value at that depth level; and

(e) modifying, by a computer, the trial variation of the subsurface characteristic in accordance with the comparison to thereby produce a visual or a stored representation mapping the relative arrangement of discretely boundaried subsurface earth formation beds.

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## 4,314,340

## CONTROL OF DRIVE TRAIN NOISES DURING A SHIFT OPERATION OF AN AUTOMATIC, VARIABLE SPEED TRANSMISSION

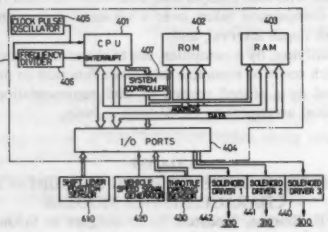
**Nobuaki Miki; Mutsumi Kawamoto, both of Nagoya; Hiroyuki Amano, Chiryu; Tsuneo Hida, Toyokawa, and Tsuyoshi Yoshida, Toyota, all of Japan, assignors to Aisin-Waner Kabushiki Kaisha, Anjyo, Japan**

**Filed Jan. 28, 1980, Ser. No. 116,133**

**Claims priority, application Japan, Feb. 14, 1979, 54-16481**

**Int. Cl.³ B60K *41/08, 41/22;* G06F *15/20***

**U.S. Cl. 364—424.1** **4 Claims**




1. A system for controlling an automatic variable speed transmission including a hydraulic circuit having a plurality of oil pressure control valves and flow path switching means for selectively engaging or disengaging clutches and brakes of the transmission, and a plurality of solenoid valves associated with a shift operation, said system comprising electronic control means responsive to shift lever position, vehicle speed and throttle opening, and having gear ratio change reference data for providing control signals to said solenoid valves to thereby control the operation of the transmission wherein;

said electronic control means is responsive to a reduction of the throttle opening below a predetermined value to provide control signals to said solenoid valves for preventing up shift transition of the transmission within a predetermined time.

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## 4,314,341

## AIRCRAFT AUTOMATIC PILOT WITH AUTOMATIC EMERGENCY DESCENT CONTROL APPARATUS

**Gary G. Kivela, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.**

**Filed Jan. 24, 1980, Ser. No. 114,785**

**Int. Cl.³ G05D *1/08***

**U.S. Cl. 364—433** **8 Claims**

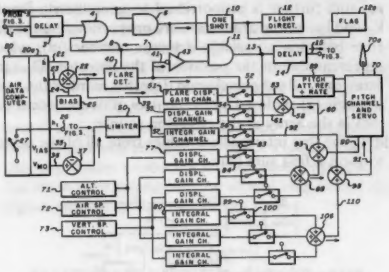
1. In an automatic flight control system for aircraft having a signal-responsive pitch control channel for controlling the aircraft pitch attitude, an automatic emergency descent control apparatus for automatically controlling the descent of the aircraft to a predetermined safe low altitude upon cabin decompression at a very high altitude, said emergency descent apparatus comprising:

first switch means responsive to the altitude of the aircraft,

second switch means responsive to the air pressure within the aircraft cabin,

means responsive to said first and second switch means for providing an initiation signal for said apparatus when said aircraft is above a predetermined altitude and when said cabin pressure decreases below its normal pressure,

airspeed responsive means for providing a control signal corresponding to a maximum operating airspeed for said aircraft, and




means responsive to said initiating signal for supplying said airspeed control signal to said pitch control channel for controlling the craft pitch attitude to achieve said maximum operating airspeed.

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## 4,314,342

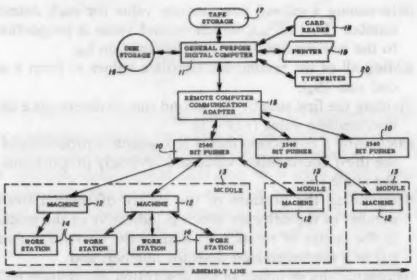
## UNSAFE MACHINES WITHOUT SAFE POSITIONS

**Ridge W. McNeir, Garland, and Claude D. Head, III, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Apr. 16, 1971, Ser. No. 134,388**

**Int. Cl.³ G06F *15/46***

**U.S. Cl. 364—468** **7 Claims**




1. An assembly line, said assembly line having a plurality of work stations for processing workpieces including at least one unsafe work station:

(a) means for storing the number of safe work stations which are downstream from said unsafe work station;

(b) a first counter, means for operating said first counter to determine the total number of safe downstream work stations which are not presently in operation;

(c) subtraction means responsive to said safe storage means and said counter to obtain the difference between the number of safe downstream work stations which are not presently in operation, and the total number of safe downstream work stations;

(d) a second counter, means for operating said second counter to determine the number of workpieces actually present in all work stations downstream from said unsafe machine, and

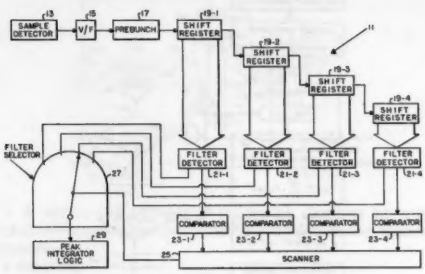
(e) comparison means responsive to said subtraction means and said second counter means for allowing a workpiece to enter said unsafe work station only when said number of safe work stations exceeds said number of workpieces.

## 4,314,343

## METHOD AND APPARATUS FOR DETECTING AND INTEGRATING CHROMATOGRAPHIC PEAKS

Barrett L. Tomlinson, Santa Clara, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Jan. 25, 1980, Ser. No. 115,335
Int. Cl.[3] G06F *15/20*
U.S. Cl. 364—498 6 Claims




1. In a method of integrating peaks in a chromatographic analysis of the kind in which time varying signals are fed to a filter detector which detects weighted average slope or curvature over a time period in order to detect the presence of the peak to be integrated, the improvement comprising,

using a multiplicity of filter detectors having different averaging time periods for detecting the presence of a peak,

scanning the output of the filter detectors to find a detecting filter detector whose output detects the presence of a peak,

then selecting as the integrating filter detector a filter detector whose averaging period is closely matched to the shape of the detected peak as detected by the detecting filter detector, and

integrating the peak with the selected filter detector.

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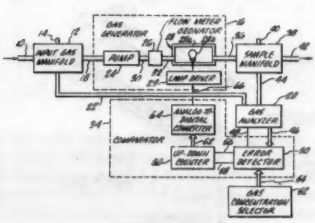
## 4,314,344

## METHOD AND APPARATUS FOR GENERATING SELECTED GAS CONCENTRATIONS

Robert K. Johns, West Covina; Donald W. Deist, Glendale, and Owen M. Houston, Moor Park, all of Calif., assignors to Dasibi Environmental Corporation, Glendale, Calif.

Filed Jan. 31, 1980, Ser. No. 117,258
Int. Cl.[3] G06F *15/46*; C01B *13/12*; G05D *25/02*
U.S. Cl. 364—500 15 Claims




1. A method for generating a calibration gas flow including a concentration of a selected gas in a carrier gas comprising the steps of

generating a first signal,

providing a concentration of the selected gas within the carrier gas in response to the first signal,

determining the concentration of the selected gas and generating a second signal proportional thereto,

generating a third signal proportional to a predetermined concentration of the selected gas,

comparing the second and third signals to determine the difference therebetween, and

adjusting the first signal to decrease the difference between the second and third signals.

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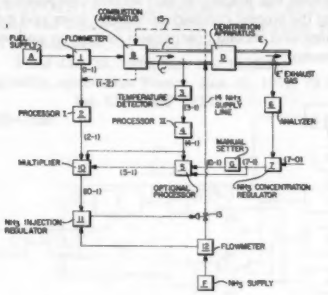
## 4,314,345

## CONTROLLING THE INJECTION OF AMMONIA IN A DRY TYPE EXHAUST GAS DENITRATION PROCESS

Yoshihiro Shiraishi, and Naohiko Ukawa, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaishi, Tokyo, Japan

Continuation-in-part of Ser. No. 2,805, Jan. 11, 1979, abandoned. This application Jul. 28, 1980, Ser. No. 172,853
Claims priority, application Japan, Jan. 23, 1978, 53-5835
Int. Cl.[3] G05D *11/02*; G01D *53/34*
U.S. Cl. 364—500 4 Claims




3. A system for controlling injection of ammonia in a dry type of exhaust gas denitration process, in which ammonia is injected into and mixed with a combustion exhaust gas containing nitrogen oxides to decompose and remove said nitrogen oxides; comprising:

first means for deriving and storing, on the basis of a predetermined relationship between a produced nitrogen oxides concentration and a numerical value representing the amount of combustion, the amount of nitrogen oxides as a function of the numerical value representing the amount of combustion;

second means for deriving and storing, on the basis of a predetermined relationship between the combustion exhaust gas temperature and the denitration performance, the ratio of ammonia to nitrogen oxides as a function of the combustion exhaust gas temperature;

means for deriving the optimum amount of injection of ammonia by multiplying the amount of nitrogen oxides obtained from the first means by the ratio of ammonia to nitrogen oxides obtained by the second means, and means for controlling the amounts of injected ammonia to equal the derived optimum amount.

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## 4,314,346

## AUXILIARY APPARATUS FOR A PARTICLE ANALYSER

Markus Feier, Regensdorf; Raymond Frey, and Ulrich Marti, both of Zurich, all of Switzerland, assignors to Contraves AG, Zurich, Switzerland

Filed Mar. 10, 1980, Ser. No. 128,643
Claims priority, application Switzerland, Mar. 27, 1979, 2824/79
Int. Cl.[3] G01N *15/02*
U.S. Cl. 364—555 1 Claim

1. In an auxiliary apparatus for a particle analyser for measuring the particle count within particle size intervals limited by displaceable thresholds, especially for a particle analyser for

the analysis of blood particles, wherein the particle analyser is equipped with feeler means generating an electrical signal corresponding to the size of the sensed particles, the improvement of which comprises:

feeler means for generating an electrical signal corresponding to the size of the sensed particles;

a first comparator;

an infeed line for connecting said feeler means with said first comparator for the infeed of the electrical signals generated by the feeler means to said first comparator;

means for generating a first comparison voltage;

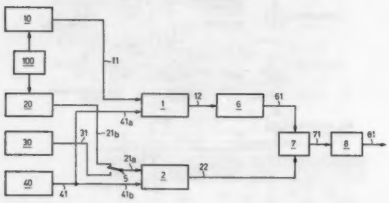
an infeed line for said first comparator for infeeding the first comparison voltage from said means generating said first comparison voltage to said first comparator;

a second comparator;

an infeed line leading from said feeler means to said second comparator for infeeding the electrical signals generated by said feeler means to said second comparator;

means for generating a second comparator voltage and having an output line means;

an infeed line leading to said second comparator for infeeding the second comparison voltage from said means generating said second comparison voltage to said second comparator;




voltage shifting means for simultaneously altering the first comparison voltage and the second comparison voltage by the same amount;

means for generating a third comparison voltage and having an output line means;

infeed line means provided for said second comparator;

reversing switch means for selectively connecting either the output line means of said means for generating a second comparison voltage or the output line means of said means for generating a third comparison voltage to the infeed line means provided for said second comparator;

said first comparator having an output side;

time-delay means containing an infeed line connected with the output side of said first comparator for delaying the output signal appearing at said infeed line leading from said first comparator to said time-delay means;

said time-delay means having an output side;

antivalence discriminator means connected by an infeed line with the output side of said time-delay means;

a further infeed line leading from the second comparator to said antivalence discriminator means;

said antivalence discriminator means having an output side; and

pulse counter means connected by an infeed line with the output side of said antivalence discriminator means.

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**4,314,347**

## SEISMIC SIGNAL PROCESSING MACHINE AND METHOD FOR NOISE REMOVAL

**John E. Stokely, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.**

**Continuation of Ser. No. 325,489, Jan. 22, 1973, abandoned. This application Jul. 5, 1977, Ser. No. 813,149**

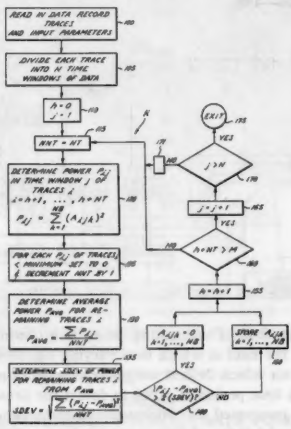
**Int. Cl.³ G01V *1/28***

**U.S. Cl. 364—574** **5 Claims**

1. A method of processing seismic signals, from seismic surveys to reduce the effect of noise bursts on such signals, comprising the steps of:

(a) recording a plurality of seismic signals from a seismic survey;

(b) determining the power level of a plurality of the recorded seismic signals during a common time interval;




(c) determining the average power of the power level so determined;

(d) removing for the common time interval those seismic signals whose power level deviates from said average power by a predetermined amount to provide a corrected seismic signal in said time interval; and

(e) recording said corrected seismic signal.

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**4,314,348**

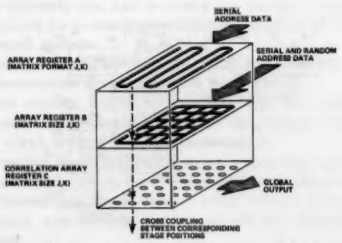
## SIGNAL PROCESSING WITH RANDOM ADDRESS DATA ARRAY AND CHARGE INJECTION OUTPUT

**William N. Carr, Dallas, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.**

**Filed Jun. 5, 1979, Ser. No. 45,797**

**Int. Cl.³ G06J *1/00*; G06F *15/336, 15/347***

**U.S. Cl. 364—604** **12 Claims**

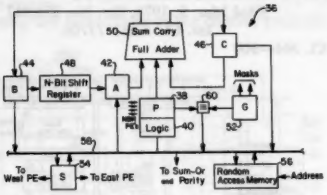

SERIAL ADDRESS DATA
SERIAL AND RANDOM ADDRESS DATA
ARRAY REGISTER A (MATRIX FORMAT J,K)
ARRAY REGISTER B (MATRIX SIZE J,K)
CORRELATION ARRAY REGISTER C (MATRIX SIZE J,K)
GLOBAL OUTPUT
CROSS COUPLING BETWEEN CORRESPONDING STAGE POSITIONS

8. A system for processing digital signals and producing a weighted output therefrom comprising; first means for shifting a serial digital signal therethrough, a second means for storing a multibit digital signal and third means for receiving the serial digital signal and the multibit digital signal and forming a product of the two signals and outputing the product in analog form.

## 4,314,349
## PROCESSING ELEMENT FOR PARALLEL ARRAY PROCESSORS

Kenneth E. Batcher, Stow, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Dec. 31, 1979, Ser. No. 108,883
Int. Cl.[3] G06F *15/16*
U.S. Cl. 364—716 15 Claims




1. A matrix of a plurality of processing elements interconnected with each other and wherein each processing element comprises:

a memory;

an adder;

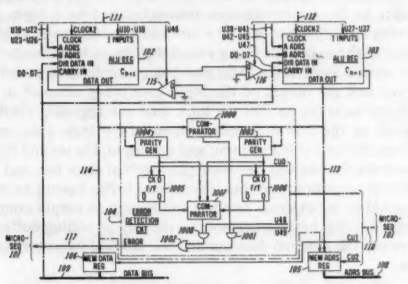
a selectably variable length shift register operatively connected to said adder, said shift register comprising a plurality of individual shift registers having gates interposed therebetween, said gates selectively interconnecting said individual shift registers; and

communication means connected to neighboring processing elements within said matrix and further connected to said adder and memory for transferring data between said memory, adder, and neighboring processing elements.

## 4,314,350
## SELF-CHECKING ARITHMETIC UNIT

Wing N. Toy, Glen Ellyn, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 31, 1979, Ser. No. 108,363
Int. Cl.[3] G06F *11/14*
U.S. Cl. 364—740 7 Claims



1. A data processing arrangement comprising:

logic means **(102, 103)** for storing first and third identical operands each having a least significant word and a most significant word and second and fourth identical operands each having a least significant word and a most significant word and for performing arithmetic operations on said operands, and error word generating means **(104)** connected to said logic means, characterized in that

said logic means is responsive to a first control signal to perform an arithmetic operation on said least significant words of said first and second operands and to perform said arithmetic operation on said most significant words of said third and fourth operands and to generate corresponding first and second output words, and responsive to a second control signal for performing said arithmetic operation on said most significant worse of said first and second operands and for performing said arithmetic operation on said least significant words of said third and fourth operands and for generating corresponding third and fourth output words;

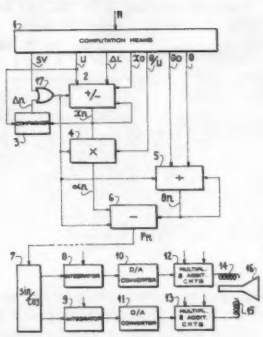
said error word generating means being responsive to said first and said second output words to generate and store corresponding first and second error words and responsive to said third and said fourth output words to generate corresponding third and fourth error words; and

said arrangement further comprising compare means **(1007)** for comparing said third error word with said stored second error word and for comparing said fourth error word with said stored first error word and for generating an error signal if a mismatch occurs.

## 4,314,351
## CURVE-GENERATING DEVICE FOR VISUAL DISPLAY OF SYMBOLS ON A CATHODE-RAY SCREEN

Michel Postel, and Jean-Pierre Bouron, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 28, 1980, Ser. No. 115,885
Claims priority, application France, Jan. 30, 1979, 79 02281
Int. Cl.[3] G06F *3/153*
U.S. Cl. 364—720 10 Claims




1. A curve-generating device for visual display of symbols on a cathode-ray screen and especially circular symbols, comprising:

digital computation means for establishing a parameter $\Delta L$ defined by the relationship,

$$R = \frac{U + \Delta L}{\theta} \text{ and } O \leqq \Delta L < U$$

where R is the radius of said circular symbol to be displayed, U is a predetermined value of an elementary vector, and $\theta$ is a predetermined value of angle at the center of a regular polygon of side $L = U + \Delta L$ circumscribed about the circle of radius R; and

operational processing logic circuits including:

(a) first adder means having a first input means for receiving the data U, $\Delta L$ and $X_o$ wherein $X_o$ is a predetermined value between **0** and L; output means for outputting a signal $X_n$; comparator means for comparing said outputted $X_n$ signal with data U and producing a data signal $\Delta_n$ signal whereby said first adder output $X_n$ signal satisfies the equation:

$$X_n = X_{n-1} + \Delta L \cdot \overline{\Delta}_{n-1} - U \cdot \Delta_{n-1}$$

(b) multiplier means for receiving the data $X_n$, $\theta$, U and $\Delta_n$ outputting a signal $\alpha_n$ staisfying the equation $\alpha_n = X_{n-1} \cdot (\theta) \cdot / (U) \cdot \Delta_{n-1}$

(c) second adder means for receiving the data $\theta$, $\theta_o$ and $\Delta_{n-1}$ and outputting a signal $\theta_n$ which satisfies the equation

$$\theta_n = \theta_{n-1} + \theta \cdot \overline{\Delta}_{n-1}$$

(d) third adder means for receiving the data $\theta_n$ and $\alpha_n$ and outputting a signal $P_n$ which is the polar angle value of the outline formed by successive elementary vectors terminating in said polygon of side L and which satisfies the equation

$$P_n = \theta_n - \alpha_n.$$

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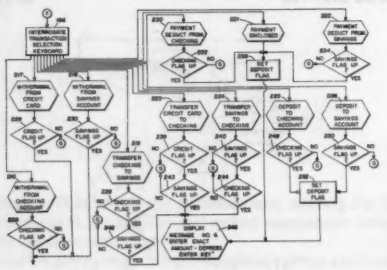
## 4,314,352
## BANKING MACHINE

**Harold D. Fought, Dallas, Tex., assignor to Docutel Corporation, Dallas, Tex.**

**Filed Apr. 12, 1972, Ser. No. 243,339**
**Int. Cl.[3] G06F *15/30***
**U.S. Cl. 364—900** **38 Claims**



1. A method of machine banking an operator selected banking transaction from a group consisting of: a withdrawal transaction, a deposit transaction, a transfer transaction and a payment transaction by banking apparatus responsive to coded data on a document, the apparatus including means for reading the coded data, means for entering a selected banking transaction and means for entering a transaction amount, comprising the steps of:

generating a document verification signal from coded data read by means for reading,

in response to a generated document verification signal and in accordance with the operator selected banking transaction generating one of the following transaction signals: a withdrawal transaction signal, a deposit transaction signal, a transfer transaction signal or a payment transaction signal,

in response to a withdrawal transaction signal and a transaction amount from the means for entering, delivering currency in value equal to the transaction amount to the operator at the banking apparatus,

in response to a deposit transaction signal and a transaction amount from the means for entering, activating a depository to receive an envelope containing a tendered deposit,

in response to a transfer transaction signal and a transaction amount from the means for entering, activating means for recording the transaction amount transferred from one account to a second account, and

in response to a payment transaction signal and a transaction amount from the means for entering, activating the depository to receive an envelope containing a tendered payment or activate means for recording a payment from an account.

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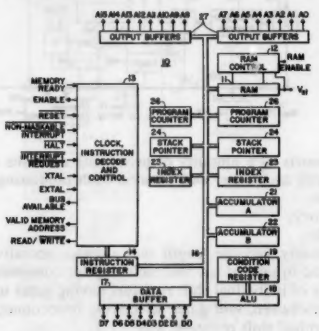
## 4,314,353
## ON CHIP RAM INTERCONNECT TO MPU BUS

**Thomas G. Gunter; Fuad H. Musa; Wm. B. Wilder, Jr., all of Austin, and Michael F. Wiles, Round Rock, all of Tex., assignors to Motorola Inc., Schaumburg, Ill.**

**Filed Mar. 9, 1978, Ser. No. 884,947**
**Int. Cl.[3] G06F *13/06***
**U.S. Cl. 364—900** **7 Claims**




1. An integrated circuit microprocessor having an on-chip RAM and including circuitry to interconnect the RAM to an internal data bus of the microprocessor and to an external data bus which interfaces to the integrated circuit microprocessor, the circuitry comprising: a sense amplifier coupled to the on-chip RAM and having an output; at least one buffer coupled to the output of the sense amplifier for buffering the output of the sense amplifier thereby providing a buffered output; a bilateral switch coupled between the buffered output of the at least one buffer and the internal data bus, the bilateral switch controllably providing an interconnect between the RAM and the internal data bus, the bilateral switch including a transistor coupling the buffered output of the at least one buffer to the microprocessor internal data bus; a logic gate having an output and at least a first and a second input, the first input of the logic gate being coupled to the at least one buffer, the second input of the logic gate being coupled to a switching signal and the output of the logic gate being coupled to the external data bus so that the logic gate can logically combine signals on the first and second inputs of the logic gate; and a second buffer having an input and an output, the second buffer controllably coupled between the external data bus and the internal microprocessor bus, the second buffer having an input coupled to the external data bus and having an output coupled to the internal microprocessor bus thereby providing buffering between the external data bus and the internal microprocessor bus.

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## 4,314,354
## MEMORY PROGRAMMABLE CONTROL

**Heinz-Friedrich Felder, Erlangen, and Manfred Schlang, Heroldsbach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Filed Sep. 19, 1979, Ser. No. 77,152**
**Claims priority, application Fed. Rep. of Germany, Sep. 28, 1978, 2842372**
**Int. Cl.[3] G06F *9/06***
**U.S. Cl. 364—900** **2 Claims**

1. In a memory programmable control with a central processing unit which is connected to a program memory for storing a control program, as well as with input modules having a number of inputs for the signal states from the process,

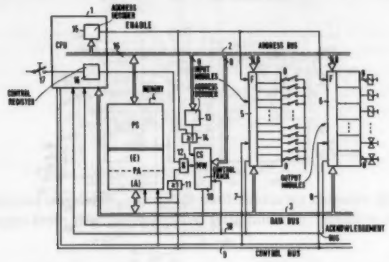
and with output modules having a number of outputs for the output states for the process, the improvement comprising:

a. providing a memory for storing a process image with an input area and an output area;

b. providing a control track means;

c. at the beginning of each processing cycle of the control program, transferring the signal states of the inputs of the input modules block by block into the input area of the process image;

d. processing the instructions of the control program with



the central processing unit using the signal states stored in the input area of the process image memory and storing the determined output states in the output area of the process image;

e. after each processing cycle, transferring the output states block by block from the process image memory into the output modules; and

f. addressing said control track means in parallel with the processing image memory and marking therein, by means of control bits, which input modules and output modules are and are not plugged in.

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## 4,314,355

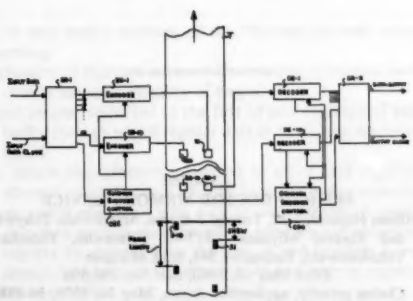
## APPARATUS AND METHOD FOR RECEIVING DIGITAL DATA AT A FIRST RATE AND OUTPUTTING THE DATA AT A DIFFERENT RATE

**Robert O. Leighou, Lakewood, and Leighton A. Meeks, Littleton, both of Colo., assignors to Martin Marietta Corporation, Bethesda, Md.**

**Division of Ser. No. 798,187, May 18, 1977, Pat. No. 4,173,014. This application Oct. 22, 1979, Ser. No. 87,424**

**Int. Cl.³ G11B *5/43***

**U.S. Cl. 364—900** **4 Claims**



1. Apparatus for arranging digital data provided in a plurality of individual information channels, said digital data provided in each said channel including a continuous serial stream of digital data bits having synchronizing signals periodically included therein and wherein all of said channels include a like number of data bits between successive synchronizing signals, and further wherein said data in each of said individual information channels may be skewed in time with respect to corresponding portions of said data in the other said information channels, said apparatus for arranging including:

a plurality of processing means, each associated with a corresponding said channel and each including storage means and means for sensing the occurrence of synchronizing signals in the corresponding channel and for storing said data bits in selected positions in said storage means in accordance with the position of said data bits in said serial stream with respect to said synchronizing signals;

activatable read-out means for reading out data from selected positions in each of said storage means associated with each of said processing means in a selected sequence whereby said data is provided in a preselected order independently of said skew occurring between said channels; and

read-out control means for activating said read-out means after a predetermined delay period has elapsed after the said sensing the occurrence of a said synchronizing signal in each of said channels, said delay period being dependent upon the maximum anticipated skew.

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## 4,314,356

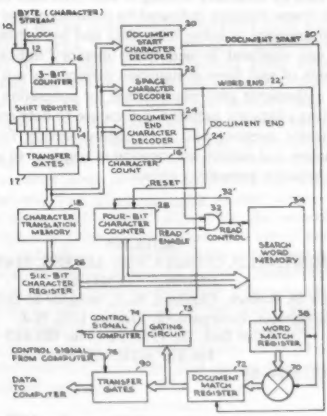
## HIGH-SPEED TERM SEARCHER

**Alfred D. Scarbrough, Northridge, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.**

**Filed Oct. 24, 1979, Ser. No. 88,048**

**Int. Cl.³ G06F *13/00***

**U.S. Cl. 364—900** **12 Claims**




1. In combination with a data source supplying a stream of binary signals defining both the identities of alphanumeric characters occurring in an ordered sequence and the position of each such character within a character group, an apparatus for detecting the occurrence of a particularly ordered group of R characters, said apparatus comprising:

search memory means comprised of a first group of R sets of S bit storage devices wherein R represents the number of entries in a character position field and S represents the number of entries in a character identification field, each of said bit storage devices defining a first or second state;

first means responsive to the position within a character group of each character defined by said binary signals for addressing the corresponding one of said R sets;

second means responsive to the identity of each character defined by said binary signals for addressing the corresponding one of said S bit storage devices within said addressed one of said R sets; and

third means responsive to said first and second means ad-

dressing a bit storage device defining a first state for generating a mismatch signal.

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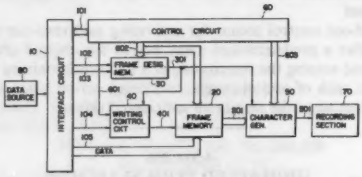
**4,314,357**

**FORM COMBINING AND RECORDING DEVICE**

**Tsutomu Kimura, and Hitoshi Miyoshi, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Dec. 19, 1979, Ser. No. 105,332**
**Claims priority, application Japan, Dec. 27, 1978, 53-161920**
**Int. Cl.³ G06F *3/14***
**U.S. Cl. 364—900** **5 Claims**




1. A form combining and recording device comprising: a frame memory for storing print data and form data; a form designation memory for storing data for determining whether contents stored in said frame memory are form data or print data; a writing control circuit for combining said form data and print data by inhibiting writing of said print data into positions in said frame memory indicated by contents of said form designation memory as being form data and by writing said form data into positions in said frame memory indicated by said contents of said form designation memory as not being form data; a character generating circuit for generating signals representing character patterns in response to data read out from said frame memory and a recording section for recording characters and pattern information in response to an output of said character generating circuit.

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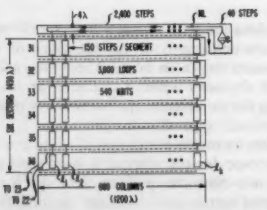
**4,314,358**

**SEGMENTED, CONDUCTOR ACCESS, MAGNETIC BUBBLE MEMORY**

**Andrew H. Bobeck, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 20, 1979, Ser. No. 105,617**
**Int. Cl.³ G11C *19/08***
**U.S. Cl. 365—19** **6 Claims**



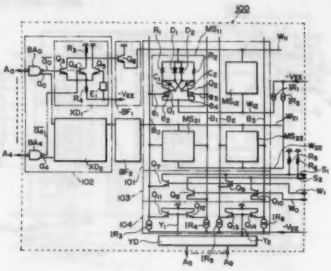

1. A magnetic bubble memory comprising a host layer of material in which magnetic bubbles can be moved synchronously about a plurality of minor loops, each of said minor loops comprising a set of segments in which bubbles can be moved selectively, said memory being characterized by means, coupled separately to corresponding segments of said minor loops and being separately energizable for moving bubbles selectively in the corresponding segments of said sets.

**4,314,359**

**SEMICONDUCTOR MEMORY DEVICE**

**Yukio Kato, Kodaira; Atsuo Hotta, Higashiyamato, and Teruo Isobe, Hinode, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jun. 6, 1980, Ser. No. 157,156**
**Claims priority, application Japan, Jun. 25, 1979, 54-79203**
**Int. Cl.³ G11C *11/40***
**U.S. Cl. 365—179** **3 Claims**



1. In a semiconductor memory device comprising:
a matrix of memory cells arranged in rows and columns;
each of said memory cells including a pair of multi-emitter transistors;
each of said pair of multi-emitter transistors having two emitters, a collector and a base;
the base and collector of one of said pair of multi-emitter transistors cross-coupled to those of the other;
one each of the emitters of said pair of multi-emitter transistors connected commonly to a current source;
the other each of the emitters of said pair of multi-emitter transistors connected to a pair of column lines, respectively;
the collectors of said pair of multi-emitter transistors connected to row lines via load means, respectively; and
a peripheral circuit consisting of plural transistors each having an emitter, collector and base, and connected to said row and column lines;
the improvement wherein capacitance means are added to said pair of multi-emitter transistors of each of said memory cells, respectively in order to increase the collector-to-base capacitance.

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**4,314,360**

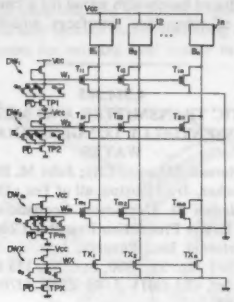
**SEMICONDUCTOR MEMORY DEVICE**

**Mitsuo Higuchi, 5-13, Yutenji 2-chome, Meguro-ku, Tokyo 153, and Kiyoshi Miyasaka, 577-45, Iijima-cho, Totsuka-ku, Yokohama-shi, Kanagawa 244, both of Japan**

**Filed May 19, 1980, Ser. No. 150,800**
**Claims priority, application Japan, May 26, 1979, 54-65349**
**Int. Cl.³ G11C *11/40***
**U.S. Cl. 365—203** **4 Claims**

1. A semiconductor memory device comprising a plurality of word lines, a plurality of bit lines and a plurality of cell transistors, each of which is connected between one of said bit lines and a point of the reference potential, characterized in that additional transistors are connected between said bit lines

and said point of reference potential, whereby suppression of the lowering of the potential of a bit line is effected by said



additional transistors when said semiconductor memory device changes from the non-operative state into the operative state.

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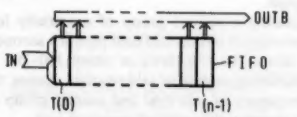
**4,314,361**

## DATA BUFFER MEMORY OF THE FIRST-IN, FIRST-OUT TYPE COMPRISING A FIXED INPUT AND A VARIABLE OUTPUT

**Pierre G. Jansen; Jozef L. W. Kessels, and Benny L. A. Waumans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 965,214, Nov. 30, 1978, abandoned.**
**This application Jun. 6, 1980, Ser. No. 157,132**
**Claims priority, application Netherlands, Dec. 12, 1977, 7713708**
**Int. Cl.³ G11C *19/00***
**U.S. Cl. 365—221** **9 Claims**




1. A data buffer memory of the "first-in, first-out" type, comprising:

a plurality of registers sequentially arranged in sectons, each section having a plurality of stages;

input means connected to the first of said registers of said buffer through which register data to be written are introduced;

an output bus selectively coupled to all of said registers through which bus data are read from said buffer memory,

logic means associated with each of said registers to ensure that data written into the buffer memory are advanced register by register from the first of said registers in response to a request to write in data and a spare register being available;

each of said logic means in use producing a status signal indicative of whether or not its associated register is full; and

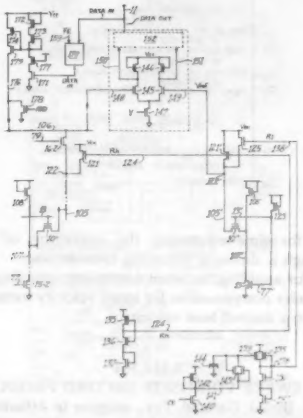
said logic means including means for receiving a status signal from an adjacent logic means and for producing from the status signals a control signal to enable the full register from the input register to be read out.

**4,314,362**

## POWER DOWN SEQUENCE FOR ELECTRICALLY PROGRAMMABLE MEMORY

**Jeffrey M. Klaas, Rosenberg; Paul A. Reed, and Isam Rimawi, both of Houston, all of Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.**

**Filed Feb. 4, 1980, Ser. No. 118,287**
**Int. Cl.³ G11C *7/00***
**U.S. Cl. 365—227** **18 Claims**



1. A memory device comprising an array of rows and columns of memory cells, means for coupling a selected one of said columns to one input of a differential sense amplifier, means coupling said selected one of said columns to reference potential via a selected one of two of said memory cells, each of said two of said memory cells being connected to said one of said columns, means separately connecting each column to a supply voltage via first load devices, a reference node connected to the other input of said differential sense amplifier, means connecting said reference node to said supply via a second load device and a third load device, the second load device having an impedence corresponding to one of said first load devices, and said third load device being of lower impedence than said second load device, means connecting said reference node to reference potential via a dummy memory cell corresponding to memory cells of said array; and means for activating said second load device and not said third memory device during a read mode of operation of said memory device and for activating said third load device during a power-down mode of operation.

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**4,314,363**

## MARINE SEISMIC CABLE HANDLER

**Ben B. Thigpen, and Joel J. Hebert, both of Houston, Tex., assignors to Western Geophysical Company of America, Houston, Tex.**

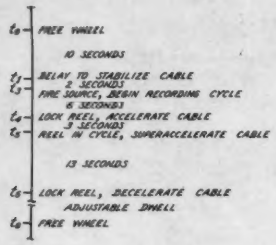
**Filed Jun. 25, 1980, Ser. No. 162,865**
**Int. Cl.³ G01V *1/38***
**U.S. Cl. 367—16** **6 Claims**

1. An improved dual-purpose cable handler for manipulating a seismic-signal detector streamer cable towed through a body of water by a ship sailing at a desired base velocity, the ship including a sound source for generating seismic impulses and a recorder for processing seismic signals received by the detector streamer cable during a recording cycle, the improvement comprising:

means for operating the cable handler in an intermittent towing mode including:

a. means for decelerating said detector streamer cable substantially to a standstill;

b. means for initiating a recording cycle;
c. means for accelerating said detector streamer cable, at the end of the recording cycle, to match the ship's velocity;
d. means for establishing a cable reel-in cycle;
e. means for decelerating said detector streamer cable upon completion of the reel-in cycle;




means for time-sequencing the operations of means a. through e. during a recording episode; and
means for applying, between successive recording episodes, a vernier compensation for small velocity variations relative to a desired base velocity.

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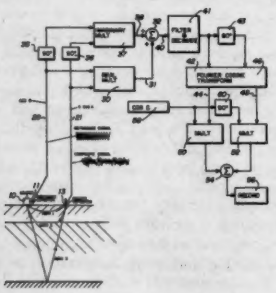
**4,314,364**

**LONG SWEEP VIBROSEIS RECORD PRODUCTION**

**Samuel H. Bickel, Garland, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.**

**Filed Jul. 26, 1979, Ser. No. 60,949**
**Int. Cl.³ G01V *1/28***
**U.S. Cl. 367—43** **13 Claims**



1. A method of generating a time domain seismic record representing subsurface interfaces on a real time basis in seismic prospecting where a continuous sweep wave input generator is utilized to impart an acoustic wave train in the earth at a seismic sending station, the combination which comprises:
(a) applying said train in the earth for a sweep interval T of the order of minutes while varying the frequency thereof monotonically over a predetermined band B;
(b) generating a reference signal representative of said train at said sending station;
(c) generating a composite signal representative of said train of waves appearing at a receiving station spaced from said sending station;
(d) producing a real part product signal from said reference signal and said composite signal;
(e) filtering out all frequency components of said product signal above the limit $B/T \times t$, where t is the travel time for a reflection from the deepest reflector of interest;
(f) decimating a predetermined fraction of said filtered signal to reduce the frequency bandwidth of said filtered signal; and
(g) generating a seismic signal by the Fourier transformation of said reduced bandwidth signal for a time domain representation of subsurface interfaces which reflected said train.

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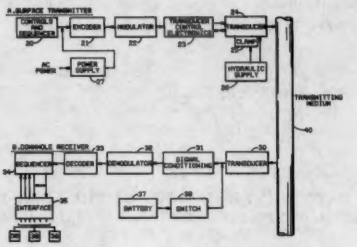
**4,314,365**

**ACOUSTIC TRANSMITTER AND METHOD TO PRODUCE ESSENTIALLY LONGITUDINAL, ACOUSTIC WAVES**

**Clifford W. Petersen, Missouri City; John M. Bednar, Houston; Edwin J. Hocker, Jr., Houston, all of Tex.; David H. Gauger, Mesa, and James M. Henderson, Scottsdale, both of Ariz., assignors to Exxon Production Research Company, Houston, Tex. and Motorola, Inc., Phoenix, Ariz.**

**Filed Jan. 21, 1980, Ser. No. 113,831**
**Int. Cl.³ G01V *1/40*; E21B *43/00***
**U.S. Cl. 367—82** **2 Claims**



1. A method for transmitting information along the length of a drill pipe comprising the steps of:
(a) generating a first group of essentially longitudinal, acoustic waves within said drill pipe at a first frequency from about 290–330 Hertz or about 350–390 Hertz with the oscillating motion of reaction masses symmetrically disposed around said drill pipe, said motion being in a direction substantially parallel to the longitudinal axis of said drill pipe;
(b) generating a second group of essentially longitudinal, acoustic waves within said drill pipe at a second frequency from about 290–330 Hertz or about 350–390 Hertz with the oscillating motion of said reaction masses, the order of the frequency of said first and second group of acoustic waves representing said information; and
(c) receiving said acoustic waves at another point along the length of said drill pipe and detecting said information.

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**4,314,366**

**METHOD AND APPARATUS FOR SELECTING AND DISPENSING INDIVIDUAL RECORDING DISCS STORED IN COMPARTMENTS IN A JUKE-BOX**

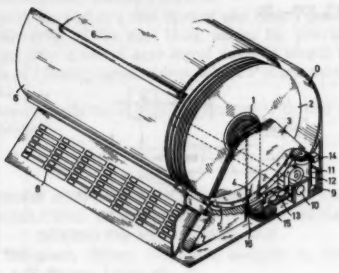
**Karl Galia, Schlossstrasse 3, Ohningen, Fed. Rep. of Germany**

**Filed Jan. 21, 1980, Ser. No. 114,077**
**Int. Cl.³ G11B *17/22***
**U.S. Cl. 369—35** **6 Claims**

1. A phonograph disc storage mechanism comprising:
storage means for a plurality of phonograph discs;
manually operable means for indicating a desired one of said discs;
a plurality of labels each having a machine readable optical code thereon, each label being in the form of a circular disc having a radius not greater than that of the title label of the phonograph disc and a centered hole, at least one label being affixed to each phonograph disc concentrically with a unique code being provided for each disc;
first signal generating means operatively connected to said

manually operable means for generating a signal corresponding to the code of the desired one of said discs;

second signal generating means for reading, successively, the code on each disc and generating signals corresponding thereto, said second means including an optical code reader, means for moving said reader in a path succes-



sively past the rim of each disc, and a light conductor for each storage position, the inlet end of said conductor being closely adjacent said label and the outlet end closely adjacent the path of movement of said reader; and

means for comparing the signal from said first signal generating means and the signals from said second signal generating means to determine the location of the desired disc.

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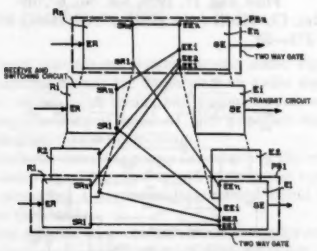
**4,314,367**

## SWITCHING CIRCUIT FOR DIGITAL PACKET SWITCHING NETWORK

**Raymond Bakka, Meudon, and Marc P. G. Dieudonne, Igny, both of France, assignors to Le Materiel Telephonique Thomson-CSF, Colombes, France**

**Filed Jan. 17, 1980, Ser. No. 113,038**
**Int. Cl.³ H04Q *11/04;* H04J *6/00***
**U.S. Cl. 370—60** **10 Claims**



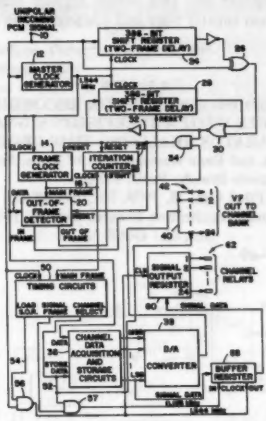
1. A digital data curst switching circuit for "self-routing" data bursts, i.e. data bursts which are capable of traversing the network simply by means of a header or preamble placed at the beginning of the data burst in accordance with pre-defined transmission protocol applicable to the network, comprising an interface to the interior of the network which comprises two-way gates which are connected to internal interfaces of other switching circuits of said network, each of said gates comprising a 1-input and n-output receive circuit and an n-input and 1-output transmit circuit, one input of the transmit circuit being connected to the output of a receive circuit different for each of the n inputs, and the input of each receive circuit of a gate being connected to the output of the transmit circuit of a gate of another switching circuit of said network.

**4,314,368**

## RECEIVER FOR PULSE CODE MULTIPLEXED SIGNALS

**Calvin H. Decoursey, 14310 Rancheros, Reno, Nev. 89511, and Todd V. Townsend, 3825 Squaw Valley Cir., Reno, Nev. 89509**

**Filed Oct. 12, 1978, Ser. No. 950,840**
**Int. Cl.³ H04J *3/06, 3/12***
**U.S. Cl. 370—108** **7 Claims**



7. A receiver for T-1 type PCM systems, comprising:

(a) comparison means for comparing, in a received PCM data pulse train, pairs of bits spaced an integral multiple of main frame intervals apart, said comparison means being arranged to provide an indicative output when the comparison indicates that the bits being compared cannot be main-frame bits;

(b) bit storage means arranged to store a control word having a length equal to an integral multiple of the number of bits in a main frame;

(c) write means connected to said comparison means and to said bit storage means, said write means being reiteratively operatively connected to successive bits of said control word in synchronism with the comparison of successive pairs of data train bits by said comparison means, and said write means being arranged to record an indication in said control word whenever said comparison means provide said indicative output;

(d) out-of-frame detection means arranged to operatively initiate a series of iterations of said write means along said control word;

(e) read means reiteratively operatively connected to successive bits of said control word in synchronism with the comparison of successive pairs of data train bits by said comparison means, said read means being arranged to provide a normally blocked indicative output whenever the control word bit being read is devoid of said indication recorded therein by said write means;

(f) gating means operatively connected to unblock said indicative output of said read means when there is at least a predetermined probability that only one bit of said control word is devoid of said indication;

(g) erasing means operatively connected to delete said indications following an iteration during which said indicative output of said read means is unblocked;

(h) means for extracting signalling bits from said received PCM data pulse train;

(i) output register means arranged to be serially loaded and to provide continuous parallel outputs;

(j) a plurality of channel relay means individually operated by said parallel outputs, said channel relay means being able to respond only to changes in said outputs persisting for more than a predetermined time interval;

(k) buffer register means connected to said extracting means and to said output register means; and

(l) clocking means connected to said buffer register means and arranged to serially load a group of extracted signalling bits serially into said buffer register over a time period greater than said predetermined interval, and to serially unload said group of extracted signalling bits from said buffer register into said output register means within a time period shorter than said predetermined interval.

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**4,314,369**

## DIGITAL CODING PROCESS FOR RECORDING SOUND CHANNELS WITH A TELEVISION SIGNAL AND APPARATUS REALIZING THIS PROCESS

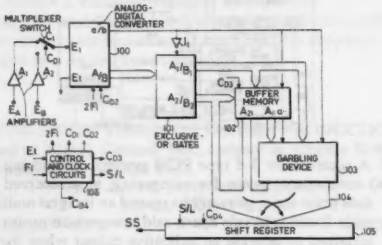
**Pierre Caillet, and Rene Romeas, both of Paris, France, assignors to Thomson-Brandt, Paris, France**

**Filed Oct. 25, 1979, Ser. No. 88,459**

**Claims priority, application France, Oct. 25, 1978, 78 30316**

**Int. Cl.³ G06F *11/14***

**U.S. Cl. 371—69** **22 Claims**




1. A method for coding analog signals at acoustic frequencies into coded digital words which are to be recorded alternatively with video signals onto an information carrier for the subsequent reading thereof, the recording and subsequent reading forming a transcription process, the coding method intended to protect the thus coded digital words from alterations encountered during the transcription process, the method for coding comprising:

analog to digital converting the analog signals into multi-bit digital words on parallel outputs;

first transforming the digital words analog-digital converted in accordance with a first transformation function to protect the digital words representing analog signal levels within a first predetermined low range from large erroneous variations due to a deterioration of only a few bits thereof, the first transformation function being as follows-(a) no alteration to the highest order bit of a digital word and (b) combining the lowest order bit of the digital word with the inverse of the highest order bit of a digital word;

parallel to series converting the first transformed digital words;

transmitting the series form digital words, resulting from the previous step, according to the following scheme-transmitting the higher order bytes of series form digital words several times with the lower order byte of the series form digital words interspersed among the repeated higher order bytes in such a manner that the distribution function related to the overall information transfer reduces to a minimum the risk of overall deterioration;

second transforming the successively transmitted series form digital words in accordance with a second transformation function permitting a subsequent error detection during an overall deterioration, the second transformation function comprising garbling the various bytes of successfully transmitted digital words.

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**4,314,370**

## WIRELESS INTERCOMMUNICATION SYSTEM

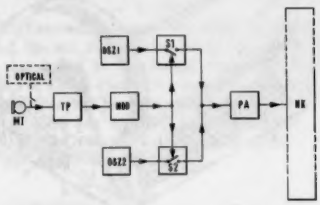
**Georg Figol, No. 28/II, Bingenerstrasse, 8000 München 50, Fed. Rep. of Germany**

**Filed May 2, 1980, Ser. No. 145,914**

**Claims priority, application Fed. Rep. of Germany, Nov. 21, 1979, 2919940; Nov. 21, 1979, 2946875**

**Int. Cl.³ H03K *13/22*; H04B *9/00***

**U.S. Cl. 375—28** **7 Claims**




1. An intercommunication system for the wireless transmission of speech, employing ternary synchronous or asynchronous delta modulation, wherein, the delta modulator (MDM) and demodulator (DEM) of each subscriber (A, B, . . N) is connected via a modem to either a radio or optical channel (NK), respectively, which is common to all subscribers, in which arrangement the model (MDM) sends either two high-frequency or optical carriers, respectively, differing by a frequency shift of $\Delta f$ to the common signal channel (NK) only for $+1$ or $-1$ signals, not for the idling state 0, from the delta modulator (MOD) and is able to receive such carriers from the common signal channel (NK) in order to decode them as $+1$ or $-1$ signals for the delta demodulator (DEM).

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**4,314,371**

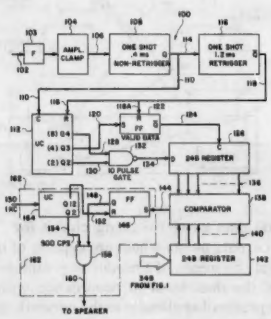
## DIGITAL RADIO COMMUNICATIONS SYSTEM WITH HIGH NOISE IMMUNITY

**Edward L. Covington, Rte. 1, Claremore, Okla. 74017, and Herman D. Self, 1225 E. Freeport, Broken Arrow, Okla. 74012**

**Filed Aug. 17, 1979, Ser. No. 67,709**

**Int. Cl.³ H04B *1/16*; H04L *27/00*; H04Q *9/12***

**U.S. Cl. 375—58** **9 Claims**




1. A radio transmitting system using a noise minimizing code, for selective calling of radio systems, using a selected multibit sequential binary word having a selected number of binary bits, such as 24, for example; and register means for storing said 24 bits; comprising

(a) means for coding said word of 24 sequential binary bits into a coded transmission of clocked trains of binary signal pulses, where each binary signal pulse of said binary signal

comprises a square pulse of selected magnitude, polarity and duration D, followed by a space of equal duration D; and wherein

(b) for each bit of said 24 binary bits which is a logical one, first means to produce a train of a selected number M of said binary signal pulses; and for each bit of said 24 binary bits which is a logical zero, second means to produce a train of a selected number N of binary signal pulses; where N is substantially different from M;

(c) between the end of a first train of said binary pulses and the beginning of the next train, means for providing a clocked time space of zero signal equal in length to the length of P binary signal pulses, where P is less than M or N; and

(d) means to modulate a radio transmitter with said coded transmission.

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**4,314,372**

## METHODS AND MEANS FOR PRODUCING AND REPRODUCING TRANSMITTED OR RECORDED SOUND OR VIDEO SIGNALS

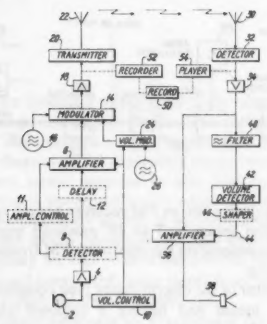
**Knud E. Bakgaard, Struer, Denmark, assignor to Bang & Olufsen A/S, Struer, Denmark**

**Continuation of Ser. No. 729,712, Oct. 5, 1976, abandoned. This application Dec. 18, 1978, Ser. No. 970,138**

**Claims priority, application United Kingdom, Oct. 6, 1975, 40769/75**

**Int. Cl.³ H04B 3/04**

**U.S. Cl. 455—68** **8 Claims**




1. A sound transmission system having audio signal input means, amplifier means for amplifying an audio signal from said audio signal input means and output circuit means for transmitting the output signal of said amplifier means to a signal utilization means comprising:

signal intensity detecting means for detecting the intensity of said audio signal supplied to said audio signal input means and producing a corresponding control signal in accordance therewith;

automatic amplification control circuit means for controlling the degree of amplification of said amplifier means in accordance with variations of said corresponding signal so that the dynamic range of the amplifier means output signal is narrower than the dynamic range of said audio signal;

auxiliary means included in said output circuit means for receiving said corresponding control signal from said intensity detecting means and effecting selective transmission of said corresponding control signal along with said transmission of the output signal of said amplifier means; and

delay means coupled to an input of said amplifier means for delaying the arrival of said audio signal at said amplifier means for enabling proper adjustment of said amplifier means in response to said corresponding control signal derived from said audio signal prior to arrival of said audio signal at said amplifier means and to allow the corresponding control signal to be transmitted ahead of the audio signal to which it pertains.

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**4,314,373**

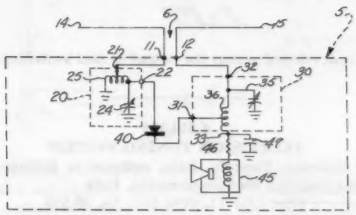
## PASSIVE TRANSMITTER INCLUDING PARAMETRIC DEVICE

**Robert W. Sellers, Palm Bay, Fla., assignor to Harris Corporation, Cleveland, Ohio**

**Continuation of Ser. No. 689,090, May 24, 1976, abandoned. This application Feb. 5, 1980, Ser. No. 118,757**

**Int. Cl.³ H04B 1/50**

**U.S. Cl. 455—73** **4 Claims**



1. A passive radio transmitter comprising: means for receiving a first radio signal, said receiving means including a first tuned circuit, tuned to a frequency F and connected to receive the first radio signal where F is the frequency of the first radio signal; parametric means coupled to said receiving means and pumped by the first radio signal, whereby said parametric means provides a subharmonic output; output means coupled to the output of said parametric means for transmitting the output thereof, said output means including a second tuned circuit tuned to a frequency F/2; modulating means coupled to said second tuned circuit for modulating the output thereof in accordance with an information signal, whereby a modulated output may be provided from said output means; and a dipole antenna having first and second terminals, wherein said first tuned circuit includes an input terminal connected to said first terminal of said antenna and said second tuned circuit includes an output terminal coupled to said second terminal of said antenna such that said first tuned circuit, parametric means, and second tuned circuit are connected in series between said first and second terminals of said antenna.

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**4,314,374**

## HIGH POWER AUDIO FREQUENCY TRANSMITTER

**John J. Kuhn, Allison Park, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.**

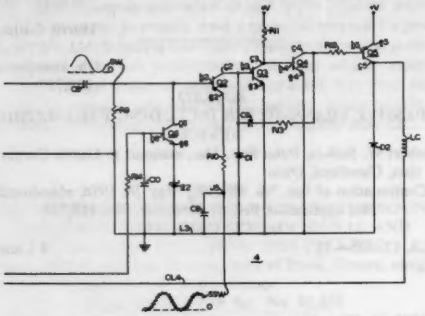
**Filed Nov. 10, 1977, Ser. No. 850,177**

**Int. Cl.³ H04B 1/04**

**U.S. Cl. 455—108** **11 Claims**

1. A transmitter circuit for producing a sine wave modulated output signal comprising, a low frequency oscillator for developing a modulating signal, a high frequency oscillator for developing a carrier signal, said modulating signal coupled to the input of a switching regulator, said switching regulator including a multiple of transmitter control stages for alternately turning on and off an output stage whereby a time varying voltage is produced at the modulating frequency, a switching amplifier, said carrier signal coupled to the input of said switching amplifier, and the time varying voltage modu-

lating output signal of said switching regulator coupled to said switching amplifier whereby the sine wave modulated output



signal is developed across the output of said switching amplifier.

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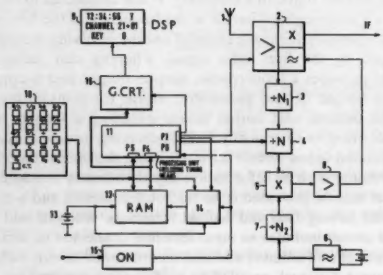
**4,314,375**

## TELEVISION TUNING SYSTEM

**Pietro Belisomi, Pinerolo, Italy, assignor to Italiana S.p.A. Indesit Industria Elettromdomestici, Italy**

**Filed May 17, 1979, Ser. No. 40,079**
**Claims priority, application Italy, May 22, 1978, 68162 A/78**
**Int. Cl.[3] H03J *7/18;* H04N *5/50***
**U.S. Cl. 455—158** **23 Claims**




1. A circuit arrangement for tuning into a television signal from among a number of radio-electric signals received by a television set fitted with a picture display device, said arrangement comprising:

(A) a controllable oscillator for generating a first signal as a function of a second signal applied thereto;

(B) a control circuit operable in at least first and second different modes of operation for selecting said television signal, said control circuit including:

(1) frequency dividing means for dividing said first signal by a binary number N;

(2) reference signal generator means for providing a reference signal;

(3) comparator means for comparing said divided first signal with said reference signal and obtaining said second signal as a function of said comparison, said second signal determining the frequency of said controllable oscillator;

(4) a processing unit;

(5) a memory comprising a plurality of memory cells for memorizing, in digital form, data relating to the television signal to be tuned into; and

(6) means for permitting the user of said television set to select said mode of operation; and

(C) character generating means; the frequency of said controllable oscillator being determined by said control circuit as a function of said binary number N, said binary number N being supplied by said processing unit to said frequency dividing means such that said controllable oscillator generates said first signal which is dependent on said number N, said processing unit generating said number N by calling up data from said memory, in response to coded input data applied thereto, when said control circuit is operated in said first mode and generating said number N without calling up data from said memory when said control circuit is operated in said second mode, and said character generator means being controllable by said processing unit and being connected to said picture display device so as to cause said display device to display alpha-numeric characters indicating which of said modes of operation said control circuit is operating in so as to facilitate tuning by the user of said television set.

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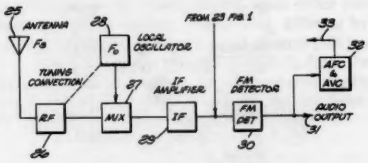
**4,314,376**

## DOUBLE-SIDEBAND, SUPPRESSED-CARRIER, SIGNAL INJECTION APPARATUS FOR MUTING IN AN FM RECEIVER

**Albert M. Williams, Los Angeles, Calif., assignor to Westland International, Tarzana, Calif.**

**Filed Apr. 14, 1980, Ser. No. 140,252**
**Int. Cl.[3] H04B *1/10***
**U.S. Cl. 455—212** **10 Claims**




1. A muting device for an FM receiver having superheterodyne conversion means and an IF passband means at least sufficient to accommodate the maximum FM frequency excursion, comprising:

an FM detector of the discriminator type coupled to said I.F. passband means and having a response characteristic which produces an output signal of one polarity responsive to a frequency input thereto on one side of the frequency corresponding to the center of said IF passband, and of the opposite polarity responsive to a frequency input thereto on the other side of said IF center frequency, said discriminator characteristic extending in frequency response on both sides of said frequency corresponding to said center of said IF passband; and

first means for generating and injecting, in the signal path ahead of said discriminator, a suppressed-carrier, double-sideband signal which is symmetrical about said IF center frequency and of amplitude level sufficient to mute said receiver and prevent noise capture in the absence of a desired received signal.

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**4,314,377**

## NOISE REMOVING APPARATUS

**Sadao Kondo, Oota, and Hiroyasu Kishi, Gunma, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan**

**Filed Mar. 25, 1980, Ser. No. 133,932**
**Claims priority, application Japan, Apr. 27, 1979, 54-52889; Jun. 1, 1979, 54-69106; Jun. 1, 1979, 54-69107**
**Int. Cl.[3] H04B *1/12;* H04H *5/00***
**U.S. Cl. 455—223** **17 Claims**

1. An apparatus for removing a noise in a composite signal

including an information signal and a reference signal of a predetermined frequency, said apparatus comprising:

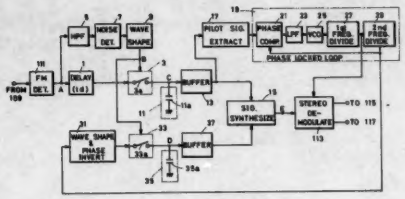
means for providing said composite signal,

means responsive to said composite signal providing means for detecting a noise signal included in said composite signal,

means responsive to said noise signal detecting means for providing an enabling signal during a predetermined time period upon occurrence of said noise signal,

first gate means responsive to said enabling signal from said enabling signal providing means for interrupting for said predetermined time period transmission of said composite signal from said composite signal providing means,

first store means coupled to the output of said first gate




means for holding a signal level of the output of said first gate means immediately before interruption of transmission of said composite signal by said first gate means,

pseudo-reference signal generating means responsive to said reference signal included in said composite signal for generating a pseudo-reference signal having substantially the same frequency as that of said reference signal,

second gate means responsive to said enabling signal for interrupting for said predetermined time period transmission of said pseudo-reference signal from said pseudo-reference signal generating means, and

signal synthesizing means for synthesizing the output of said first store means and the output of said second gate means for a time period associated with at least said predetermined time period.

**4,314,378**

## ANTENNA LOW-NOISE Q SPOILING CIRCUIT

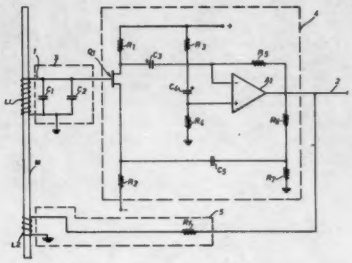
**Clarence W. Fowler, Elgin, and Bruce M. Penrod, Austin, both of Tex., assignors to Tractor, Inc., Austin, Tex.**

**PCT No. PCT/US79/00356, § 371 Date Aug. 27, 1979, § 102(e) Date Aug. 27, 1979, PCT Pub. No. WO80/02782, PCT Pub. Date Dec. 11, 1980.**

**PCT Filed May 25, 1979, Ser. No. 91,692**

**Int. Cl.³ H04B *1/18***

**U.S. Cl. 455—291** **7 Claims**



1. A detuning circuit for detuning an unloaded Q quality factor of a rod antenna, said rod antenna having a rod of magnetic conductive material defining a magnetic circuit, said detuning circuit including an LC resonant tank circuit magnetically coupled to a magnetic field induced in the magnetic circuit of the rod antenna by detected radio frequency signals, the tank circuit having loaded and unloaded Q quality factors, and where the tank circuit generates an output signal in response to the magnetic field generated in said magnetic circuit by the radio frequency signals, the detuning circuit comprising:

(a) a low-noise field effect transistor amplifier, for providing a high impedence load to said tank circuit, and for amplifying the tank output signal without introducing any appreciable noise to the rod antenna output signal;

(b) an operational amplifier connected to the output of said transistor amplifier, said operational amplifier and said transistor amplifier cooperating together to produce the antenna output signal;

(c) an inductor magnetically coupled to the magnetic circuit of the antenna; and

(d) a feedback coupler, for negatively coupling a portion of the antenna output signal to said inductor, said coupler and said inductor cooperating to establish the amount of antenna output signal negatively fed back.

# DESIGN PATENTS

## GRANTED FEB. 2, 1982

### ERRATA

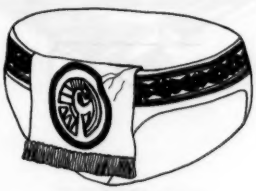
| For CLASS | See PATENT NO. |
|---|---|
| D32–009 | 262,885 |
| D34–021 | 262,886 |

# DESIGNS

## FEBRUARY 2, 1982

262,835
BATHING SUIT
Henry G. Dietz, 80 Salisbury Ave., Garden City, N.Y. 11530
Filed Apr. 19, 1978, Ser. No. 897,930
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—42

262,836
BATHING SUIT
Henry G. Dietz, 80 Salisbury Ave., Garden City, N.Y. 11530
Filed Apr. 19, 1978, Ser. No. 898,430
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—42

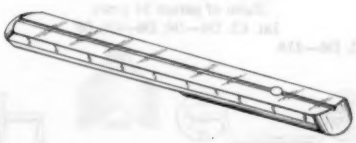


262,837
CLOTHES POCKET STRAIGHTENER
James R. Buffington, P.O. Box 7365, Daytona Beach, Fla. 32018
Filed Nov. 19, 1979, Ser. No. 95,548
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—378

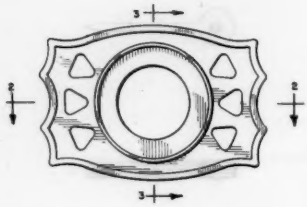
262,838
BUTTON SPACER
Gladys C. Rader, 502 Orchid Pl., Emmaus, Pa. 18049
Filed Feb. 21, 1979, Ser. No. 13,181
Term of patent 3½ years
Int. Cl. D02—*07*
U.S. Cl. D3—18

262,839
STORAGE BOX OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, and Pieter K. J. De Coster, Aalst, both of Belgium, assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 16, 1979, Ser. No. 66,898
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—74

262,840
HANDLE FOR A BRUSH
Ernst Beranek, Vienna, Austria, assignor to Eduard Frieb Gesellschaft m.b.H., Vienna, Austria
Filed Aug. 14, 1978, Ser. No. 933,719
Claims priority, application Austria, Feb. 20, 1978, 51228428
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—35



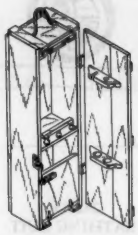
262,841
BATHROOM ACCESSORY SUPPORT FOR ATTACHMENT TO A FRAME
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,352
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—92



262,842
HOLDER FOR TOWEL OR THE LIKE
Clinton H. Morey, 166 Leisure World, Mesa, Ariz. 85206
Filed Jul. 2, 1979, Ser. No. 54,281
Term of patent 14 years
Int. Cl. D23—*02*; D8—*08*
U.S. Cl. D6—102

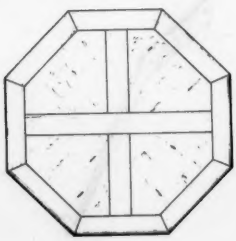
262,843
STORAGE RACK FOR A HOLSTERED HANDGUN
Maurice L. Phillips, 3211 Wendover La., Richmond, Va. 23230
Filed Jan. 3, 1979, Ser. No. 726
Term of patent 14 years
Int. Cl. D6—*04*; D8—*06, 08*
U.S. Cl. D6—114

262,844
CABINET BAR
Breck J. Richardson, 1005 Worth St. Extension, Asheboro, N.C. 27203
Filed Jul. 26, 1979, Ser. No. 61,094
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—144

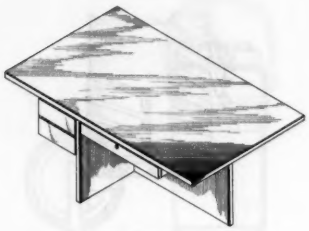


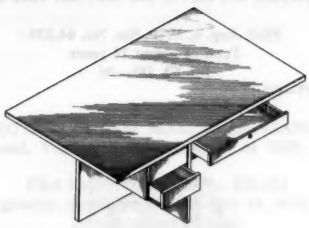


262,845
PARTY TABLE
Huey T. Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc., Galax, Va.
Filed Feb. 21, 1980, Ser. No. 123,290
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—146

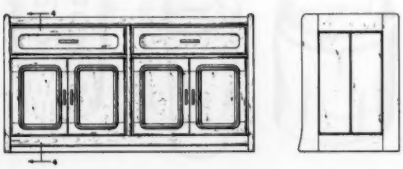


262,846
DUAL DESK UNIT
Mary E. Chaiken, 6245 Clearwood Rd., Bethesda, Md. 20034
Filed Jan. 28, 1980, Ser. No. 115,609
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—157

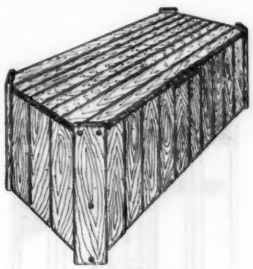




262,847
CREDENZA
Huey T. Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc., Galax, Va.
Filed Feb. 21, 1980, Ser. No. 123,282
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—159



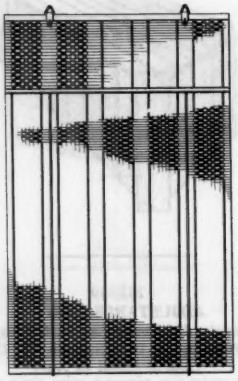
262,848
CABINET
Bruce Dowse, Rockdale, Australia, assignor to Dowse Designs Pty Limited, Sydney, Australia
Filed Dec. 12, 1978, Ser. No. 968,822
Claims priority, application New Zealand, Jun. 13, 1978, 15537
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—167



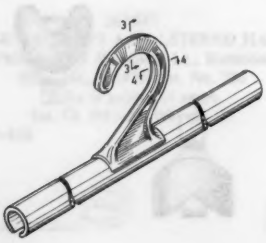
262,849
ADJUSTABLE TABLE
Darrell A. Schoenig, 432 Clover La., Ft. Collins, Colo. 80521
Filed Oct. 2, 1979, Ser. No. 81,212
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—178

262,850
HEAD AND NECK REST
George W. E. Price, 4 Longfellow Pl., 0608, Boston, Mass. 02114
Filed May 21, 1979, Ser. No. 41,286
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—200

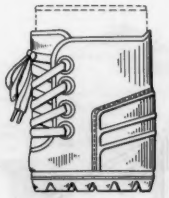
262,851
WOVEN WINDOW BLIND
Merrill J. Gitkin, Franklin Lakes, N.J., assignor to Jencraft Corporation, Totowa, N.J.
Filed Jan. 31, 1979, Ser. No. 8,844
Term of patent 14 years
Int. Cl. D6—*10*
U.S. Cl. D6—205



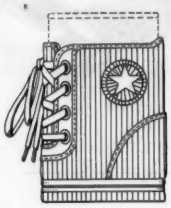
262,852
HANGER FOR CARPET DISPLAYS
Hans K. Wallenwein, 98 Grandview Ave., Thornhill, Ontario, Canada
Filed Jul. 6, 1979, Ser. No. 55,450
Claims priority, application Canada, Jun. 15, 1979, 15-06-79-3
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—252



262,853
JACKET-TYPE COASTER
M. Dean Hayden, Jr., 3937 S. 500 East, Salt Lake City, Utah 84107
Filed Aug. 6, 1979, Ser. No. 64,207
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—45

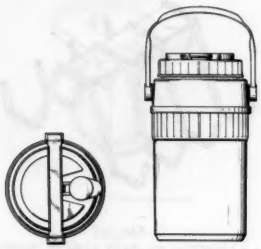


262,854
JACKET-TYPE COASTER
M. Dean Hayden, Jr., 3937 S. 500 East, Salt Lake City, Utah 84107
Filed Aug. 6, 1979, Ser. No. 64,330
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—45

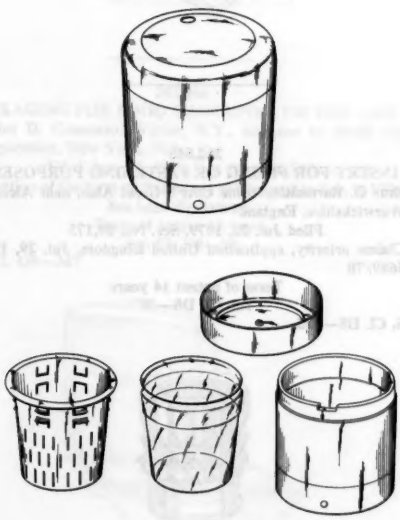


262,855
CRUET FOR VINEGAR, OIL OR THE LIKE
Andre Morin, Dollard des Ormeaux, Canada, assignor to Les Industries Provinciales LTEE, St. Damien, Canada
Filed Jul. 9, 1979, Ser. No. 55,600
Claims priority, application Canada, Jun. 21, 1979, 21-06-79-10
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—59

262,856
INSULATED JUG
James A. MacTavish, and Ronald C. McGowan, both of Houston, Tex., assignors to Igloo Corporation, Houston, Tex.
Filed Jun. 7, 1979, Ser. No. 46,582
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—77

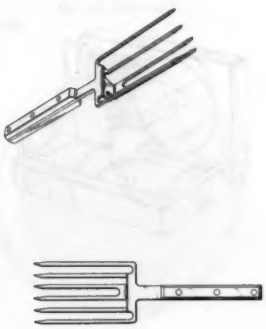


262,857
COTTAGE CHEESE MAKING APPLIANCE
Pierre Ansel, Vagney, France, assignor to SEB, Selongey, France
Filed Nov. 7, 1978, Ser. No. 959,194
Claims priority, application France, May 16, 1978, 150
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—96

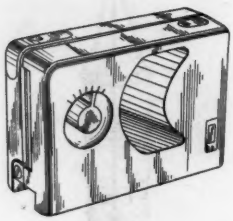


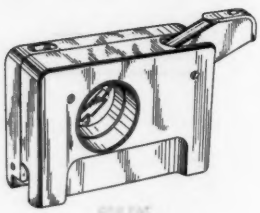
262,858
HANGING GAS COOKER FOR CAMPERS
Francois Martin, Tournus, France, assignor to Manufacture Metallurgique de Tournus, Tournus, France
Filed Oct. 10, 1979, Ser. No. 83,535
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—107

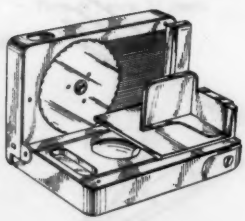
262,859
FOOD FORK
James E. Russell, Houston, Tex., assignor to Universal Food Fork Corporation, Houston, Tex.
Filed Feb. 19, 1980, Ser. No. 123,176
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—151



262,860
DOMESTIC APPLIANCE FOR GRATING, SLIVERING AND SLICING
Bernard Loiseau, Dijon, France, assignor to SEB, Selongey, France
Filed Jul. 26, 1979, Ser. No. 61,041
Claims priority, application France, Feb. 6, 1979, 79 156
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—153







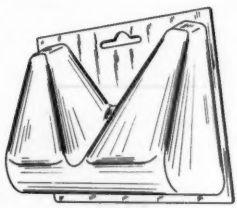
262,861
FIREPLACE GRATE
Sonny J. S. Lee, 6273 Walker Ave., Burnaby, British Columbia, Canada (V5E 3B5)
Filed Jul. 27, 1979, Ser. No. 61,212
Term of patent 7 years
Int. Cl. D7—*08*
U.S. Cl. D7—207

262,862
GLUE GUN HOLDER
Charlotte E. Lytle, 70 Oakleigh Dr., Maitland, Fla. 32751
Filed Dec. 28, 1979, Ser. No. 108,148
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

262,863
INSERT FOR FIXING OR FASTENING PURPOSES
Arthur D. Barnsdale, "Alne Cote", Great Alne, near Alcester, Warwickshire, England
Filed Jul. 20, 1979, Ser. No. 59,175
Claims priority, application United Kingdom, Jul. 29, 1978, 985689/78
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—385

262,864
SCREW ANCHOR
John N. Schavilje, Mt. Prospect, and David C. Boyer, Chicago, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed Oct. 9, 1979, Ser. No. 70,570
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—385

262,865
PACKAGING FORM FOR ELECTRIC LAMPS
Jean Lecordier, Issy-les-Moulineaux, France, assignor to Fabriques Reunies de Lampes Electriques, Issy-les-Moulineaux, France
Filed Mar. 22, 1979, Ser. No. 23,049
Claims priority, application France, Sep. 22, 1978, 76876
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—345

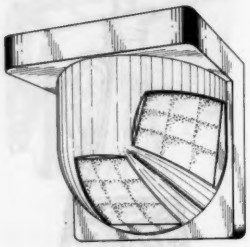


262,866
PACKAGING FOR FOOD CONTAINER OR THE LIKE
Nicholas D. Commisso, Victor, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Jun. 27, 1977, Ser. No. 810,557
The portion of the term of this patent subsequent to Feb. 9, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—347

262,867
COMBINED BOTTLE AND STOPPER
Michael K. Goettner, Sylvania, and James E. Plummer, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Jun. 21, 1979, Ser. No. 50,831
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—378

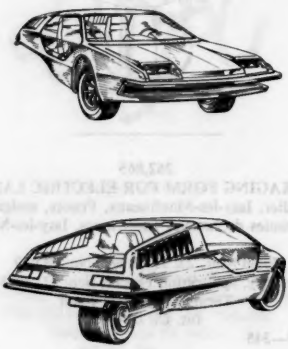
262,868
HOUSING FOR A FIRE AND SMOKE DETECTOR
Donald J. Westphal, South Elgin, Ill., assignor to Pittway Corporation, Northbrook, Ill.
Filed Oct. 30, 1978, Ser. No. 956,350
Term of patent 7 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

262,869
INFRARED INTRUSION DETECTOR
John K. Guscott, Lynnfield, and Gianfranco D. Zaccai, Newton, both of Mass., assignors to American District Telegraph Company, New York, N.Y.
Filed Apr. 26, 1979, Ser. No. 33,756
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



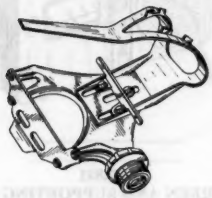
262,870
FIGURINE OF A BEAVER
Jesus A. Carvajales Santa Eulalia, and Javier B. Carvajales Santa Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Jun. 22, 1978, Ser. No. 918,318
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

262,871
AUTOMOBILE
Ronald H. Powers, 1433 Superior Ave., #372, Newport Beach, Calif. 92663
Filed Oct. 12, 1979, Ser. No. 84,634
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—85



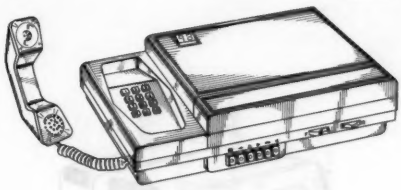
262,872
VAN
Guido Magrini, Brescia, Italy, assignor to Fiat Veicoli Industriali S.p.A., Turin, Italy
Filed Sep. 7, 1978, Ser. No. 940,238
Claims priority, application Italy, Mar. 14, 1978, 53021
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—99

262,873
PEDAL FOR BICYCLES
Shinpei Okajima, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan
Filed Dec. 11, 1978, Ser. No. 968,407
Claims priority, application Japan, Jun. 17, 1978, 53/25318
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—125

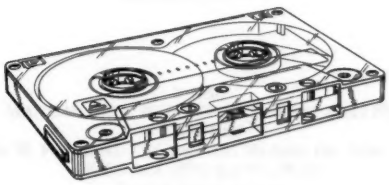


262,874
TIRE
Joseph V. Mendiola, Ravenna; Lawrence G. Jansen, and Robert B. Norton, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Aug. 20, 1979, Ser. No. 68,254
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—141

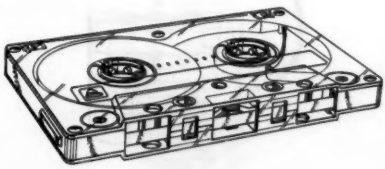
262,875
TELEPHONE ANSWERING DEVICE
Aldo Franchi, Saronno; Severino Tessarollo, and Luigi Pesenti, both of Milan, all of Italy, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Sep. 22, 1978, Ser. No. 944,944
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—4



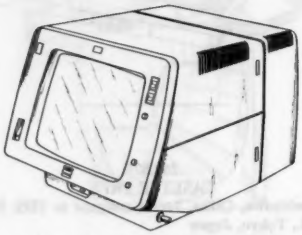
262,876
CASETTE TAPE
Keiichi Yoshizawa, Chiba, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan
Filed May 21, 1979, Ser. No. 40,762
Claims priority, application Japan, Nov. 21, 1978, 53-49117
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—11



262,877
CASETTE TAPE
Keiichi Yoshizawa, Chiba, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan
Filed May 21, 1979, Ser. No. 40,983
Claims priority, application Japan, Nov. 21, 1978, 53-49117
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—11



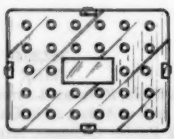
262,878
VIDEO DATA DISPLAY TERMINAL
Edward Chamberlain, Eastleigh; Nicholas M. Leon, and Michael H. Sharp, both of Winchester, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 28, 1979, Ser. No. 24,817
Claims priority, application United Kingdom, Oct. 2, 1978, 986654/78
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—113



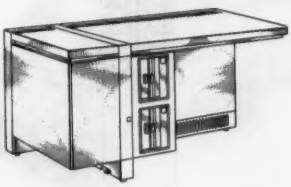
262,879
TELEPHONE
Eric J. Marshall, Flat 8, 5 Carlton Gardens, London S.W.1, England
Filed Apr. 2, 1979, Ser. No. 26,225
Claims priority, application United Kingdom, Nov. 25, 1978, 987427; Mar. 16, 1979, 989077
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

262,880
CLOCK RADIO
Peter H. J. van de Ven, Valkenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 30, 1979, Ser. No. 71,201
Claims priority, application United Kingdom, Mar. 8, 1979, 988.925
Term of patent 14 years
Int. Cl. D14—*03;* D10—*01*
U.S. Cl. D14—73

262,881
VIEWING SCREEN AND SUPPORTING STRUCTURE
Marvin P. Hodges, 6162 Leeland St. S., St. Petersburg, Fla. 33715
Filed Feb. 22, 1979, Ser. No. 14,063
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—84



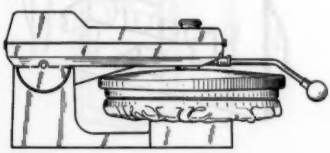
262,882
COMPUTER CONTROL TERMINAL
John W. Goodin, Long Beach; Douglas H. Grambush; Milton J. Halsted, both of Irvine, all of Calif., and Katsuo Kumagai, Kanazawa, Japan, assignors to Fujitsu Limited, Kanagawa, Japan
Filed Jun. 18, 1979, Ser. No. 49,317
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—103



262,883
HAND HELD READER
Medford D. Sanner, Irving, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.
Filed Oct. 29, 1979, Ser. No. 88,965
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—116

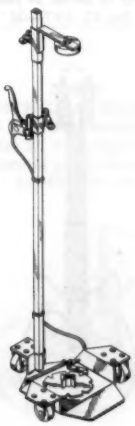
262,884
FLUID PUMP OR SIMILAR ARTICLE
Herman S. Fessler, Coon Rapids, Minn., assignor to The Coca-Cola Company, Atlanta, Ga. and The Cornelius Company, Anoka, Minn.
Filed Jan. 29, 1980, Ser. No. 116,504
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7

262,885
IRONING PRESS
Olindo Baruffa, Thonex, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland
Filed May 18, 1979, Ser. No. 40,229
Claims priority, application Switzerland, Dec. 1, 1978, 110145
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—9



262,886
DUST AND MIST COLLECTOR
Tadashi Yoshimura, Nagoya, Japan, assignor to Ryosei Co., Ltd., Nagoya, Japan
Filed Apr. 6, 1979, Ser. No. 27,783
Claims priority, application Japan, Oct. 6, 1978, 53-42861
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D34—21

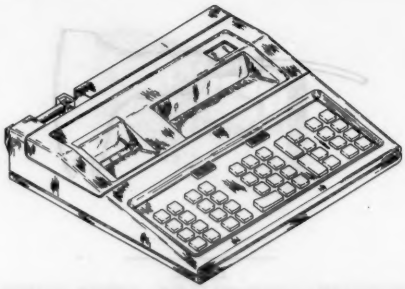
262,887
MANUAL FULL WEB STRETCH-WRAP PALLET WRAPPER
John W. Powell, III, 4305 Reef Rd., Marietta, Ga. 30066
Filed Dec. 3, 1979, Ser. No. 99,497
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—145



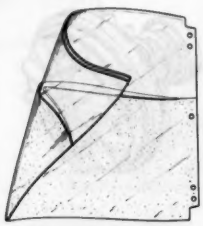
262,888
ORGAN
Thomas E. Kimble, Covington, Ky., assignor to Baldwin Piano & Organ Company, Cincinnati, Ohio
Filed Aug. 6, 1979, Ser. No. 63,993
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D17—6

262,889
GUITAR
Bozo Pondunavac, 2726 University, San Diego, Calif. 92104
Filed Aug. 29, 1979, Ser. No. 70,900
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—19

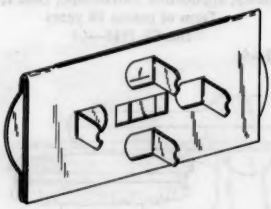
262,890
CASE FOR PRINTING CALCULATOR OR THE LIKE
Shinpei Ichikawa, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 1, 1978, Ser. No. 965,644
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7



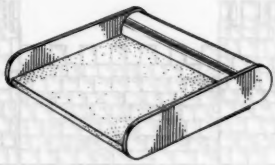
262,891
TRANSPARENT STORAGE ENVELOPE FOR FLEXIBLE, MAGNETIC COMPUTER DISCS
Richard Nast, 309 Whippoorwill La., Brentwood, Tenn. 37027
Filed Oct. 15, 1979, Ser. No. 84,728
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—33



262,892
MATHEMATICAL AID
Burton S. Heiko, 15 Steuben Dr., Jericho, N.Y. 11753
Filed Jul. 2, 1979, Ser. No. 54,303
Term of patent 3½ years
Int. Cl. D19—*07*
U.S. Cl. D19—64



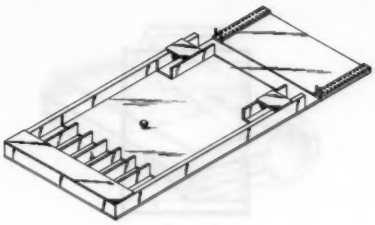
262,893
DESK ACCESSORY RECEPTACLE
Robert A. Martin, Thousand Oaks, Calif., assignor to Metcor Manufacturing, Los Angeles, Calif.
Filed Sep. 25, 1978, Ser. No. 945,577
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—92



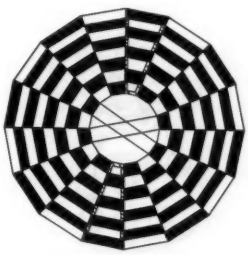
262,894
VENDING MACHINE CABINET
Walter E. Moore, Bel-Nor, and Albert K. Grethey, Bridgeton, both of Mo., assignors to UMC Industries, Inc., Stamford, Conn.
Filed Sep. 26, 1978, Ser. No. 945,839
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D20—4

262,895
LUGGAGE TAG
Bela G. Szabo, Carnegie, Pa., assignor to Bruce Plastics, Inc., Pittsburgh, Pa.
Filed Aug. 30, 1979, Ser. No. 70,997
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D20—27

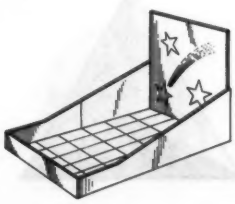
262,896
SHUFFLE POOL TABLE GAME BOARD
Allen D. Dabbs, 17839 Jefferson Hwy., Baton Rouge, La. 70816
Filed Jan. 8, 1979, Ser. No. 1,461
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—7



262,897
GAMEBOARD
Donald D. Goldeen, 130 Ulloa St., San Francisco, Calif. 94127
Filed Jan. 7, 1980, Ser. No. 110,321
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—33



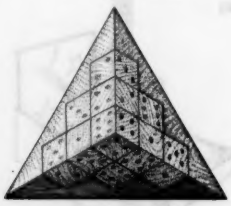
262,898
DICE GAME BOARD
Frank Lonardo, 2343 Bath Ave., Brooklyn, N.Y. 11214
Filed May 21, 1979, Ser. No. 40,718
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—41



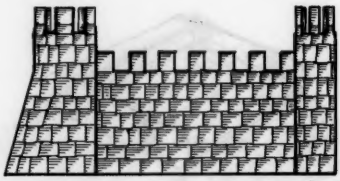
262,899
TOY WRITING SLATE
Frederick H. Kroll, 72 Wood Hollow La., New Rochelle, N.Y. 10804
Filed May 9, 1979, Ser. No. 37,447
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—59

262,900
KINETIC SCULPTURE
Hidetoshi Matsui, 6-27-311, Imazunaka 3-chome, Tsurumi-ku, Osaka, Japan
Filed Sep. 4, 1979, Ser. No. 71,891
Claims priority, application Japan, Apr. 6, 1979, 54-14092
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D21—102

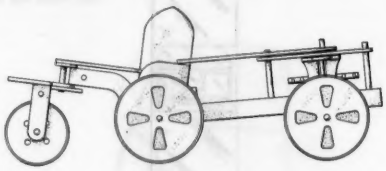
262,901
PUZZLE OR SIMILAR ARTICLE
Dragan Vukadinovic, 4812 Woodrow Ave., Parma, Ohio 44134
Filed Jul. 31, 1979, Ser. No. 62,492
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—107



262,902
TOY CASTLE
Gabriel H. Duarte, 434 Hill St., Orange, Calif. 92669
Filed Sep. 24, 1979, Ser. No. 78,665
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—114



262,903
ARTICULATED VEHICLE OR THE LIKE
Robert W. Becker, 5800 McDougal Dr., Fayetteville, N.C. 28304, and Keith L. Bradshaw, 1928 W. Hill Dr., Fayetteville, N.C. 28306
Filed Aug. 31, 1979, Ser. No. 71,555
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—135

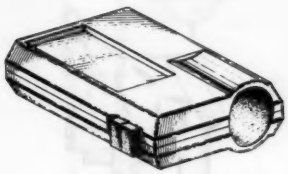


262,904
COMBINED SELF-CONTAINED WATER RESERVOIR AND GOLF CLUB SCRUB BRUSH OR SIMILAR ARTICLE
Carl C. Markwood, and Marie K. Markwood, both of 4001 Fair Oaks Blvd., Sacramento, Calif. 95825
Filed Jul. 27, 1979, Ser. No. 61,258
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234

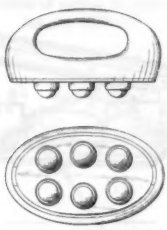
262,905
ELECTRICALLY HEATED SHOWER HEAD
Helio Tommaso, Atibaia, Brazil, assignor to Produtos Eletricos Corona Ltda., Guarulhos, Brazil
Filed Apr. 23, 1979, Ser. No. 32,215
Claims priority, application Brazil, Oct. 16, 1976, 3600876[U]
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

262,906
ROOM DEDORANT DISPENSER
Richard C. Palson, Medfield, and John C. Armstrong, Milton, both of Mass., assignors to The Pharmasol Corporation, Randolph, Mass.
Filed Sep. 13, 1979, Ser. No. 74,915
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

262,907
PULSE COUNTER, OR SIMILAR ARTICLE
Shinji Koshino, Shibukawa, Japan, assignor to Nihon Seimitsu Sokki Co., Ltd., Shibukawa, Japan
Filed Jan. 31, 1979, Ser. No. 8,701
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

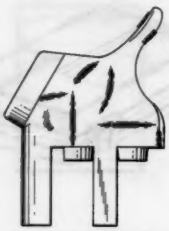


262,908
HAND-HELD BODY MASSAGER
Manny N. Pesco, P.O. Box 10772, Phoenix, Ariz. 85064
Filed Feb. 26, 1979, Ser. No. 15,478
Term of patent 14 years
Int. Cl. D28—*03;* D24—*99*
U.S. Cl. D24—36

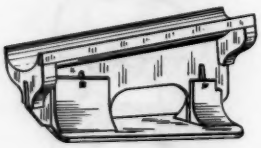


262,909
RECTANGULAR CURVED SLIDE SPA
John L. Haller, 7249 Carrizo Dr., La Jolla, Calif. 92037
Filed Dec. 6, 1978, Ser. No. 966,908
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02*
U.S. Cl. D24—38

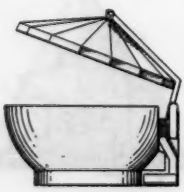
262,910
MIDSTREAM COLLECTION HOUSING
Carl J. Steigerwald, Wauconda, and Terry N. Layton, Arlington Heights, both of Ill., assignors to The Kendall Company, Boston, Mass.
Filed Dec. 12, 1979, Ser. No. 102,672
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—51



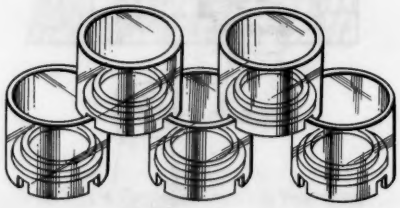
262,911
LEG REST
Lloyd A. Weddell, 552 Krotzer Ave., Luckey, Ohio 43443
Filed Aug. 29, 1979, Ser. No. 70,849
Term of patent 14 years
Int. Cl. D24—*01;* D6—*06*
U.S. Cl. D24—64



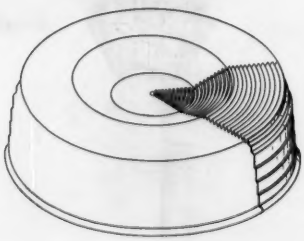
262,912
MOBILE KIOSK
Yvon Therien, 5055 Bellechasse, suite 23, Montreal, P.Q., Canada (H1T2A3); Rene Therien, 393 rue Gosselin, Quebec, P.Q., Canada (G1P-3G2), and Charles Therien, 2753 Baldwin, Montreal, P.Q., Canada (H1L-5B3)
Filed Dec. 10, 1979, Ser. No. 101,801
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—23



262,913
CANDLE HOLDER
Henry P. Glass, Northfield, Ill., assignor to Westerlo House, Inc., Westerlo, N.Y.
Filed Sep. 17, 1979, Ser. No. 76,203
Term of patent 7 years
Int. Cl. D26—*01*
U.S. Cl. D26—13



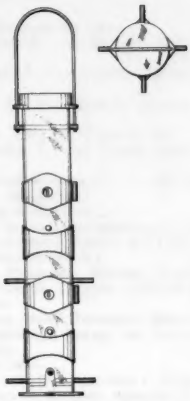
262,914
LENS FOR LUMINAIRE
Paul J. Kristofek, Hickory Hills, Ill., assignor to McGraw-Edison Company, Rolling Meadows, Ill.
Filed Apr. 6, 1979, Ser. No. 27,781
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—135



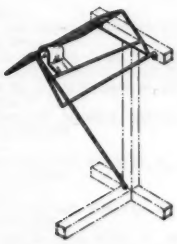
262,915
COMB
Walter Tihonovich, 1330 Pine, Pueblo, Colo. 81004
Filed Jan. 30, 1980, Ser. No. 116,858
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—30

262,916
COMB
Walter Tihonovich, 1330 Pine, Pueblo, Colo. 81004
Filed Jan. 30, 1980, Ser. No. 116,927
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—30

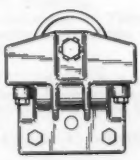
262,917
BIRD FEEDER
Peter Kilham, Foster, R.I., assignor to Droll Yankees, Inc., Foster, R.I.
Filed Sep. 17, 1979, Ser. No. 75,977
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—14



262,918
SUPPORT RACK FOR A WESTERN SADDLE OR THE LIKE
Jeffrey M. Perkins, 20122 Cape Cottage La., Huntington Beach, Calif. 92646
Filed Feb. 4, 1980, Ser. No. 117,856
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—45



262,919
THREE WHEEL TROLLEY
John F. Miller, P.O. Box 277, Howell, Mich. 48843
Filed Mar. 15, 1979, Ser. No. 20,662
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—35



# LIST OF PATENTEES

## TO WHOM

## PATENTS WERE ISSUED ON THE 2ND DAY OF FEBRUARY, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See*—
Shanklin, James R., Jr.; Shamblee, Dwight A.; and Walsh, David A., 4,313,949, Cl. 424-248.560.

Abbey-Etna Machine Company: *See*—
Caswall, Robert D., Jr.; and Kaase, George W., 4,313,329, Cl. 72-290.000.

Abblard, Jean; and Lacroix, Guy, to Rhone-Poulenc Agrochimie. Pesticidal sulfur containing amides derived from aniline and the method of preparation thereof. 4,313,957, Cl. 424-301.000.

Abbott Laboratories: *See*—
Larkin, Mark E.; and Meyer, Leonard J., 4,313,904, Cl. 264-515.000.

Abe, Atsushi; Ogawa, Hisahito; Nishikawa, Masahiro; Sekido, Satoshi; and Hayakawa, Shigeru, to Matsushita Electric Industrial Co., Ltd. Gas sensing device. 4,313,338, Cl. 73-23.000.

Abe, Tadafumi: *See*—
Urai, Muneharu; Abe, Tadafumi; Haraguchi, Youichiro; and Hayashi, Koji, 4,313,776, Cl. 156-220.000.

Abel, William A.: *See*—
Massey, Lester G.; Brabets, Robert I.; and Abel, William A., 4,313,737, Cl. 44-1.00C.

Abele, Alan C. Outdoor weather instrumentation station. 4,313,345, Cl. 73-431.000.

ACF Industries, Incorporated: *See*—
Burns, Ivan A.; and Hochmuth, William R., 4,313,458, Cl. 137-327.000.
Wempe, Richard J.; and Behle, Gunter R., 4,313,591, Cl. 251-144.000.

Ackeret, Peter, to Licinvest AG. Episcope. 4,313,675, Cl. 355-40.000.

Acton, Edward M.; and Mosher, Carol W., to SRI International. 3'-Deamino-3'-(4-methoxy-1-piperidinyl) derivatives of daunorubicin and doxorubicin. 4,314,054, Cl. 536-17.00A.

Acurex Solar Corporation: *See*—
McEntee, John F., 4,313,422, Cl. 126-426.000.

Adams, Don L., Sr.: *See*—
Sivahop, Albert; Adams, Don L., Sr.; and Fischer, William C., 4,314,307, Cl. 361-194.000.

Adams, John F., to H. E. Rudge and Company Limited; and Associated Builders Merchants Limited. Valve for drinking fountains. 4,313,466, Cl. 137-614.170.

Adams & Westlake Company, The: *See*—
Ehret, Yale W.; and Kasner, Gerald C., 4,313,280, Cl. 49-141.000.

Adamson, Kenneth S., to Grove Valve and Regulator Company. Sequentially operated valve structure. 4,313,462, Cl. 137-512.100.

Adin, Anthony; and Fleming, James C., to Eastman Kodak Company. Transition metal photoreduction systems and processes. 4,314,019, Cl. 430-202.000.

Aeroquip Corporation: *See*—
Holmes, Paul M., 4,313,453, Cl. 137-74.000.

Aetna Bearing Company: *See*—
Dagiel, Richard T., 4,313,644, Cl. 308-233.000.

Agar Corporation N.V.: *See*—
Agar, Joram, 4,313,829, Cl. 210-242.300.

Agar, Joram, to Agar Corporation N.V. Apparatus for separating the components of a non-Newtonian fluid. 4,313,829, Cl. 210-242.300.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Cases, Jean M.; Valence, Georges; and Lietard, Olivier, 4,313,822, Cl. 209-233.000.
Oiry, Joel; and Imbach, Jean-Louis, 4,314,076, Cl. 564-33.000.

Agency of Industrial Science and Technology: *See*—
Komatsuzaki, Shigeki; and Sato, Moriichi, 4,313,840, Cl. 252-78.500.

Agfa-Gevaert AG: *See*—
Borowski, Kurt; and Wagensonner, Eduard, 4,313,656, Cl. 354-29.000.
Hell, August; Borowski, Kurt; Cocron, Istvan; and Huber, Theodor, 4,313,655, Cl. 354-25.000.
Stemme, Otto; and Wagensonner, Eduard, 4,313,663, Cl. 354-271.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Bauer, Walter; and Farber, Heinrich, 4,313,538, Cl. 206-455.000.
Cocron, Istvan, 4,314,187, Cl. 318-611.000.
Gernert, Herbert, 4,314,024, Cl. 430-564.000.
Ruf, Wolfgang; and Wagensonner, Eduard, 4,314,235, Cl. 340-347.0AD.

Agfa-Gevaert N.V.: *See*—
Willemsens, Karel S., 4,313,980, Cl. 427-402.000.

Agusto, Robert G.: *See*—
Basa, Kenneth B.; and Agusto, Robert G., 4,313,966, Cl. 426-250.000.

Air Preheater Company, Inc., The: *See*—
Stockman, Richard F., 4,313,489, Cl. 165-9.000.

Air Products and Chemicals, Inc.: *See*—
Beitchman, Burton D.; and Mascioli, Rocco L., 4,314,037, Cl. 521-125.000.
Dalton, Augustine I., Jr.; and Skinner, Ronald W., 4,313,806, Cl. 204-147.000.
Ford, Michael E.; and Johnson, Thomas A., 4,314,083, Cl. 564-479.000.
Gulley, Mark R., 4,313,788, Cl. 162-31.000.
Herman, Frederick L.; and Dixon, Dale D., 4,314,067, Cl. 548-320.000.
Martinez de Pinillos, Joaquin V.; and Fowlkes, Robert L., 4,314,084, Cl. 564-480.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Hori, Takanobu; and Hayashi, Masaharu, 4,313,531, Cl. 192-58.00B.
Inada, Masami; and Aoki, Kongou, 4,313,366, Cl. 91-459.000.

Aisin-Waner Kabushiki Kaisha: *See*—
Miki, Nobuaki; Kawamoto, Mutsumi; Amano, Hiroyuki; Hida, Tsuneo; and Yoshida, Tsuyoshi, 4,314,340, Cl. 364-424.100.

Aizawa, Tatsuo: *See*—
Matsumoto, Shoji; Matsui, Toshikazu; Ikeda, Toshimitsu; Kozuka, Nobuhiko; Nishihama, Hitoshi; and Aizawa, Tatsuo, 4,314,018, Cl. 430-125.000.

Akbaeva, Galina M.: *See*—
Fesenko, Evgeny G.; Dantsiger, Alla Y.; Filipiev, Viktor S.; Razumovskaya, Olga N.; Klevtsov, Alexandr N.; Lebedev, Vladimir N.; Grineva, Ljudmila D.; Rogach, Tatyana V.; Feronov, Anatoly D.; Akbaeva, Galina M.; Cheptsov, Evgeny I.; Panich, Anatoly E.; Lisitsina, Ljudmila G.; Lavrikova, Svetlana A.; Ochirov, Vasily A.; Dudkina, Svetlana I.; Nevsky, Alexandr N.; Aleshin, Vladimir A.; Kupriyanov, Mikhail F.; Baljunis, Evgeny S.; Mordanov, Boris P.; Zhitomirsky, Grigory A.; Feldman, Naum B.; Smazhevskaya, Ekaterina G.; and Devlikanova, Ravilya U., 4,313,839, Cl. 252-62.900.

Akimoto, Hideo: *See*—
Kobayashi, Isao; Akimoto, Hideo; Takahashi, Yoshiyuki; Hibiya, Tokio; and Hata, Masayuki, 4,313,343, Cl. 73-290.00V.

Akiyama, Mitsuo: *See*—
Kuru, Hiroshi; Akiyama, Mitsuo; and Ikemoto, Isao, 4,314,242, Cl. 340-617.000.

Akizuki, Katsufumi: *See*—
Segawa, Hiroshi; and Akizuki, Katsufumi, 4,313,753, Cl. 71-61.000.

Akzona Incorporated: *See*—
Castro, Anthony J.; and Stoll, James W., 4,314,040, Cl. 525-6.000.
Leuvering, Johannes H. W., 4,313,734, Cl. 23-230.00B.
Richmond, James M.; Reck, Richard A.; and Bernard, Gary A., 4,313,895, Cl. 260-501.150.
Zengel, Hans; Bergfeld, Manfred; and Klostermeier, Werner, 4,314,089, Cl. 568-949.000.

Alago, James L.: *See*—
Lieb, Nathaniel H.; Alderman, Albert D., Jr.; and Alago, James L., 4,313,725, Cl. 433-126.000.

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Aldridge, Clyde L.; and Bearden, Roby, Jr., to Exxon Research & Engineering Co. Hydrocracking process utilizing high surface area catalysts. 4,313,818, Cl. 208-108.000.

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Alexy, Fred H., to AMG Industries, Inc. Thermal insulation end panel assembly for a paper machine dryer cylinder and stud clamp therefor. 4,313,267, Cl. 34-108.000.

Alfa-Laval AB: *See*—
Olofsson, Hans K., 4,313,396, Cl. 119-14.440.

Alford, Harvey E.; and Frazier, David, to Standard Oil Company, The. Emulsifier system for tertiary oil recovery. 4,313,835, Cl. 252-8.5ɔD.

Alfred Wertli Inc.: *See*—
Reymont, Bertrand, 4,313,488, Cl. 164-448.000.

Alink, Han: *See*—
Oude Elberink, Bernard H. M.; Damhuis, Gerardus J. M.; and Alink, Han, 4,314,247, Cl. 343-6.5LC.

Allen, Lawrence H.: *See*—
Pelton, Robert H.; Allen, Lawrence H.; and Nugent, Henry M., 4,313,790, Cl. 162-163.000.
Allesch, Roland: *See*—
Janssen, Sylvain; Tourret, Jean; Zarudiansky, Alain; and Allesch, Roland, 4,313,317, Cl. 62-514.00R.
Allis-Chalmers Corporation: *See*—
James, Larry R., 4,313,729, Cl. 474-135.000.
Alps Electric Co., Ltd.: *See*—
Ohkita, Masao; and Yamashita, Hitoshi, 4,314,118, Cl. 200-16.00F.
Althaus, Werner: *See*—
Wischniewski, Martin; Feicho, Lutz; and Althaus, Werner, 4,313,930, Cl. 424-32.000.
Amano, Hiroyuki: *See*—
Miki, Nobuaki; Kawamoto, Mutsumi; Amano, Hiroyuki; Hida, Tsuneo; and Yoshida, Tsuyoshi, 4,314,340, Cl. 364-424.100.
Amax Inc.: *See*—
Huggins, Dale K.; Queneau, Paul B.; and Beckstead, Leo W., 4,313,914, Cl. 423-58.000.
Vukasovich, Mark S.; and Robitaille, Dennis R., 4,313,837, Cl. 252-49.500.
Amchem Products, Inc.: *See*—
Frelin, Frank J.; Kelly, Timm L.; and Malloy, Anthony J., 4,313,769, Cl. 148-6.270.
AMCS Corporation: *See*—
Harbin, Charles M., 4,313,238, Cl. 15-37.000.
American Bottlers Equipment Co., Inc.: *See*—
Fauth, Frederick E., 4,313,536, Cl. 198-781.000.
American Can Company: *See*—
Bemis, Lester E.; Kincaid, Charles M.; and White, Hugh L., 4,313,767, Cl. 134-1.000.
American Cyanamid Company: *See*—
Baker, Pamela K.; Asato, Goro; and Dusza, John, 4,313,885, Cl. 260-347.200.
Barbuscio, Frank D.; Hunter, LeRoy; Hourihan, Joseph C.; Inglis, Mary C.; Oberstar, Helen E.; and Saad, Hosny, 4,313,393, Cl. 116-200.000.
Bollyky, Laszlo J.; and Rauhut, Michael M., 4,313,843, Cl. 252-188.3CL.
Pasarela, Nunzio R., 4,313,940, Cl. 424-215.000.
Raghu, Sivaraman; Hoffmann, Arthur K.; and Singh, Balwant, 4,314,066, Cl. 548-320.000.
Raghu, Sivaraman, 4,314,079, Cl. 564-220.000.
Szucs, Stephen S., 4,313,754, Cl. 71-94.000.
American Fly Ash Company: *See*—
Pound, Joseph H., 4,313,762, Cl. 106-85.000.
American Hoist & Derrick Company: *See*—
Yargici, Zekeriya, 4,313,691, Cl. 404-117.000.
American Hospital Supply Corporation: *See*—
Stout, David M., 4,314,082, Cl. 564-381.000.
American Microcar, Inc.: *See*—
Pivar, Stuart, 4,313,517, Cl. 180-216.000.
American Standard Inc.: *See*—
Darrow, John O. G.; and Pierro, Joseph J., 4,314,234, Cl. 340-825.360.
Darrow, John O. G., 4,314,237, Cl. 340-502.000.
Darrow, John O. G., 4,314,306, Cl. 361-182.000.
Amery, John G., to RCA Corporation. Chrominance transcoder. 4,314,273, Cl. 358-11.000.
Ames-Yissum Ltd.: *See*—
Fridlender, Bertold R., 4,313,927, Cl. 424-1.000.
AMG Industries, Inc.: *See*—
Alexy, Fred H., 4,313,267, Cl. 34-108.000.
Amko B.V.: *See*—
van Rumpt, Jacob; and Vorstenbosch, Martinus T., 4,313,269, Cl. 38-143.000.
AMP Incorporated: *See*—
Donmoyer, William L.; and Fortuna, Jon A., 4,314,312, Cl. 361-400.000.
Millhimes, Wayne L.; and Sheesley, Wilmer L., 4,313,646, Cl. 339-156.00R.
Ampex Corporation: *See*—
Gyi, Maung, 4,314,288, Cl. 360-65.000.
Ryan, John O., 4,314,184, Cl. 315-408.000.
AMSTED Industries Incorporated: *See*—
Littlefield, John B., 4,313,869, Cl. 260-38.000.
Amtrol Inc.: *See*—
Walker, Robert; and Lane, Joseph A., 4,313,400, Cl. 122-31.00R.
Amundson, David C.: *See*—
Knudson, Mark B.; and Amundson, David C., 4,313,442, Cl. 128-419.0PG.
Anderson, Charles W.: *See*—
Good, Garry R.; and Anderson, Charles W., 4,313,503, Cl. 172-140.000.
Anderson, Emmett R.; and Schatz, Douglas S., to Energy Research Associates. Transformer power supply having an inductively loaded full wave rectifier in the primary. 4,314,324, Cl. 363-90.000.
Anderson, Eric J., to Hayward Tyler Limited. Means for stabilizing equipment supported in an enclosure. 4,313,498, Cl. 166-206.000.
Anderson, John E.: *See*—
Kallenberger, Robert H.; and Anderson, John E., 4,313,723, Cl. 432-37.000.
Ando, Takao: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,313,939, Cl. 424-180.000.
Andros, Frank E.; and Shay, Robert J. E., to International Business Machines Corporation. Micro helix thermo capsule. 4,313,492, Cl. 165-104.260.
Angersbach, Wolfgang; and Kling, Rudolf, to Quick-Rotan Elektromotoren GmbH. Driving arrangement with a friction clutch. 4,313,532, Cl. 192-113.00B.
Anic S.p.A.: *See*—
Dozzi, Giovanni; and Cucinella, Salvatore, 4,313,891, Cl. 260-448.0AD.
Antoine, Robert: *See*—
Llabres, Raymond; Antoine, Robert; Lacotte, Jean P.; and Marchi, Charles, 4,313,718, Cl. 425-290.000.
Antoniw, Walter W.; Silagy, Richard J.; and Norton, James F., to Tuthill Corporation. Valve assembly and method. 4,313,594, Cl. 251-357.000.
Anzai, Masayasu: *See*—
Tokunaga, Kazuyoshi; Anzai, Masayasu; Hoshi, Nobuyoshi; and Tanno, Kiyohiko, 4,314,257, Cl. 346-74.400.
Aoki, Harumi: *See*—
Tokutomi, Seijiro; Jyojiki, Masao; Nakamura, Kazuo; and Aoki, Harumi, 4,313,657, Cl. 354-53.000.
Aoki, Hatsuo: *See*—
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Aoyagi, Keizo: *See*—
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Appalachian Electronic Instruments, Inc.: *See*—
Van Wilson, Marlin; Nickell, Lawrence C.; and Nickell, Larry C., 4,313,578, Cl. 242-149.000.
Application Des Gaz: *See*—
Pivot, Jean-Claude; and Aucagne, Jean, 4,313,998, Cl. 428-222.000.
Applied Magnetics Corporation: *See*—
Carmichael, Dumont M., 4,313,535, Cl. 198-766.000.
Aqua-Chem, Inc.: *See*—
Williams, Stanley A.; and Tesch, Allen R., 4,314,139, Cl. 219-285.000.
Arena, Blaise J., to UOP Inc. Use of metal ions in preparation of anhydropolyols. 4,313,884, Cl. 260-345.90R.
Arias, Jose V. Process for coating ferrous metal articles and resulting articles. 4,314,005, Cl. 428-467.000.
Arimura, Hirofumi; Nagai, Masanori; Yamauchi, Takeshi; Kitagawa, Tsutomu; and Suyama, Tadakazu, to Green Cross Corporation, The. Interferon inducer and method of preparing same. 4,313,938, Cl. 424-180.000.
Arnold, Maurice E., Jr.: *See*—
Martner, Samuel T.; and Arnold, Maurice E., Jr., 4,313,380, Cl. 181-116.000.
Arthur D. Little, Inc.: *See*—
Cairns, Walter J.; and Van Vloten, Curtis P., 4,314,259, Cl. 346-75.000.
Arthur, Jack P., to Wm. E. Hooper & Sons Co. Mophead and method of manufacturing. 4,313,774, Cl. 156-73.100.
Artz, Gerd, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method of removing front and rear segments of wire rod. 4,313,356, Cl. 83-37.000.
AS Phonix: *See*—
Hojbjerg, Svend, 4,313,690, Cl. 404-114.000.
Asahi Glass Company, Ltd.: *See*—
Kojima, Gen; Tamura, Masayuki; and Hisasue, Michio, 4,314,043, Cl. 525-102.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Doi, Tsunesuke; Ide, Akira; and Kishimoto, Yasushi, 4,314,048, Cl. 528-44.000.
Asahi Kogaku Jogyo Kabushiki Kaisha: *See*—
Tokutomi, Seijiro; Jyojiki, Masao; Nakamura, Kazuo; and Aoki, Harumi, 4,313,657, Cl. 354-53.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kurei, Hiroshi; and Morisawa, Tahei, 4,313,662, Cl. 354-237.000.
Asai, Koichi; and Kawada, Tohsuke, to Fuji Mfg. Co., Ltd. System for applying electronic components to a circuit board. 4,313,251, Cl. 29-564.600.
Asai, Kuniaki: *See*—
Imai, Shozaburo; Suzuki, Haruo; Asai, Kuniaki; and Ueno, Katsuji, 4,313,870, Cl. 260-40.00R.
Asano, Masaharu: *See*—
Hosaka, Akio; and Asano, Masaharu, 4,313,412, Cl. 123-480.000.
Asato, Goro: *See*—
Baker, Pamela K.; Asato, Goro; and Dusza, John, 4,313,885, Cl. 260-347.200.
Aschauer, George R., to Twin Disc, Incorporated. Interleaved friction plate type clutch having clutch cooling passage means including a reservoir, weir and slot. 4,313,533, Cl. 192-113.00B.
Asea Aktiebolag: *See*—
Brogardh, Torgny; and Sander, Lars, 4,313,344, Cl. 73-355.00R.
Ashley, Sheldon J. Multipurpose double barrel syringe and method of manufacture of same. 4,313,440, Cl. 128-218.00R.
Ashton, Richard D. A. Display rack. 4,313,544, Cl. 211-181.000.
Associated Builders Merchants Limited: *See*—
Adams, John F., 4,313,466, Cl. 137-614.170.
Associated Electrical Industries Limited: *See*—
Stuttard, Ivan, 4,313,247, Cl. 29-33.00F.

Associated Engineering Limited: *See—*
Noddings, John; and Borton, Roland K., 4,314,165, Cl. 307-310.000. Scott, Peter A. J., 4,313,608, Cl. 277-27.000.

Atari, Inc.: *See—*
Mayer, Steven T.; and Milner, Ronald E., 4,314,236, Cl. 340-384.00E.

Ateliers des Charmilles S.A.: *See—*
Pfau, Jean; and Wavre, Alain, 4,314,133, Cl. 219-69.00M.

Atkins, Ian A.: *See—*
Terry, John V.; Terry, Raymond M.; and Atkins, Ian A., 4,314,319, Cl. 362-287.000.

Atlantic Richfield Company: *See—*
Bickel, Samuel H., 4,314,364, Cl. 367-43.000.
Khoobiar, Sargis, 4,314,074, Cl. 562-535.000.

Atoji, Hitomi; and Yamada, Mitsuhiko, to Dainippon Screen Seizo Kabushiki Kaisha. Digital color correction method. 4,314,274, Cl. 358-80.000.

Attix, Douglas J., to Babcock & Wilcox Company, The. Guide tube sleeve. 4,313,797, Cl. 376-441.000.

Attwood, Stanley W.; and Stilwell, James H., to Motorola Inc. Noise chopper for preventing false locks in a coherent carrier recovery system. 4,314,206, Cl. 329-50.000.

Aubergeon, Olivier: *See—*
Cherier, Jacques; Dupressoir, Albert; and Aubergeon, Olivier, 4,314,246, Cl. 343-6.00R.

Aucagne, Jean: *See—*
Pivot, Jean-Claude; and Aucagne, Jean, 4,313,998, Cl. 428-222.000.

Austermann, Karl: *See—*
Janssen, Manfred; Austermann, Karl; and Schmidt, Volker, 4,313,328, Cl. 72-276.000.

Austin Company, The: *See—*
Raab, Frederick H., 4,314,251, Cl. 343-112.00R.

Austin, Richard G.; and Michaelson, Robert C., to Exxon Research & Engineering Co. Hydroxylation of olefins. 4,314,088, Cl. 568-860.000.

Australian Atomic Energy Commission: *See—*
Sowerby, Brian D., 4,314,155, Cl. 250-253.000.

Authier, Charles A., to Talon, Inc. Woven slide fastener stringer with molded reinforcing projections on upper connecting threads. 4,313,244, Cl. 24-205.13R.

Avco Everett Research Laboratory, Inc.: *See—*
Douglas-Hamilton, Diarmaid H., 4,313,739, Cl. 55-2.000.

Azuma, Hideo: *See—*
Shimizu, Hiroshi; Daigo, Toshiyuki; and Azuma, Hideo, 4,313,832, Cl. 210-663.000.

B.C. Reasearch Council: *See—*
Oehr, Klaus H., 4,313,804, Cl. 204-93.000.

B. F. Goodrich Company, The: *See—*
Odar, Joseph, 4,314,045, Cl. 526-93.000.

Baas, Hendrik B., to Holland Bergen op Zoom B.V. Machinefabriek en/IJzergieterij. Butterfly valve. 4,313,592, Cl. 251-162.000.

Babb, Albert L.; and Parks, Richard E., to Biotek, Inc. Automated, spring-powered medicament infusion system. 4,313,439, Cl. 128-214.00F.

Babcock & Wilcox Company, The: *See—*
Attix, Douglas J., 4,313,797, Cl. 376-441.000.
Lawrie, William E.; Womack, Robert E.; and White, Norvell W., Jr., 4,313,791, Cl. 376-252.000.

Babler, James H. Method of preparing monoesters. 4,314,071, Cl. 560-127.000.

Bahl, Om P., to Research Corporation. Antigen for early pregnancy test and contraceptive vaccine. 4,313,871, Cl. 260-112.00B.

Bain, Lee L.: *See—*
Fischbeck, Kenneth H.; Wright, Allen T.; Bain, Lee L.; and Paraskevopoulos, Demetris E., 4,314,282, Cl. 358-286.000.

Baird, John K.; Sandford, Paul A.; and Shim, Jaewon L., to Merck & Co., Inc. Synergistic blends of cellulase-free xanthan gum and cellulosics. 4,313,765, Cl. 106-197.00C.

Baker, Pamela K.; Asato, Goro; and Dusza, John, to American Cyanamid Company. Furfuryl thiourea compounds. 4,313,885, Cl. 260-347.200.

Baker, Rees T. K.: *See—*
Sherwood, Rexford D.; Baker, Rees T. K.; Derouane, Eric G.; and Pieters, Wim J. M., 4,313,853, Cl. 252-445.000.

Bakgaard, Knud E., to Band & Olufsen A/S. Methods and means for producing and reproducing transmitted or recorded sound or video signals. 4,314,372, Cl. 455-68.000.

Bakka, Raymond; and Dieudonne, Marc P. G., to Le Materiel Telephonique Thomson-CSF. Switching circuit for digital packet switching network. 4,314,367, Cl. 370-60.000.

Bakker, Pieter, to U.S. Philips Corporation. Line circuit. 4,314,106, Cl. 179-16.00F.

Baldacci, Massimo. Method of treating acute alcoholic intoxication with pyridoxine P.C.A. 4,313,952, Cl. 424-263.000.

Baljunis, Evgeny S.: *See—*
Fesenko, Evgeny G.; Dantsiger, Alla Y.; Filipiev, Viktor S.; Razumovskaya, Olga N.; Klevtsov, Alexandr N.; Lebedev, Vladimir N.; Grineva, Ljudmila D.; Rogach, Tatyana V.; Feronov, Anatoly D.; Akbaeva, Galina M.; Cheptsov, Evgeny I.; Panich, Anatoly E.; Lisitsina, Ljudmila G.; Lavrikova, Svetlana A.; Ochirov, Vasily A.; Dudkina, Svetlana I.; Nevsky, Alexandr N.; Aleshin, Vladimir A.; Kupriyanov, Mikhail F.; Baljunis, Evgeny S.; Mordanov, Boris P.; Zhitomirsky, Grigory A.; Feldman, Naum B.; Smazhevskaya, Ekaterina G.; and Devlikanova, Ravilya U., 4,313,839, Cl. 252-62.900.

Ballestrazzi, Aris: *See—*
Tassi, Lamberto; Tosarelli, Gianni; and Ballestrazzi, Aris, 4,313,288, Cl. 53-74.000.

Bambara, Joseph E.; and Sanville, W. Woodward, to Servo Corporation of America. Railroad car wheel bearing heat signal processing circuit. 4,313,583, Cl. 246-169.00A.

Bamberger, Carlos E., to United States of America, Energy. Thermochemical cyclic system for decomposing $H_2O$ and/or $CO_2$ by means of cerium-titanium-sodium-oxygen compounds. 4,313,925, Cl. 423-263.000.

Band & Olufsen A/S: *See—*
Bakgaard, Knud E., 4,314,372, Cl. 455-68.000.

Banucci, Eugene G.; and Boldebuck, Edith M., to General Electric Company. Particulated polyetherimide and method for making. 4,314,047, Cl. 528-26.000.

Bany, Stephen W.: *See—*
Koshar, Robert J.; and Bany, Stephen W., 4,313,988, Cl. 428-40.000.

Barbe, Charles A., III: *See—*
Breidenstein, Charles J.; and Barbe, Charles A., III, 4,314,110, Cl. 179-175.20R.

Barbuscio, Frank D.; Hunter, LeRoy; Hourihan, Joseph C.; Inglis, Mary C.; Oberstar, Helen E.; and Saad, Hosny, to American Cyanamid Company. Indicator device for detecting the amount of sebum in hair and scalp and method therefor. 4,313,393, Cl. 116-200.000.

Barfurth, Dieter; and Nestler, Heinz, to Dynamit Nobel AG. Liquid, cold-stable titanium catalyst preparation. 4,313,851, Cl. 252-431.00R.

Barger, William M., to French Oil Mill Machinery Company, The. Apparatus for the continuous extraction of oils and soluble substances from solid materials. 4,313,912, Cl. 422-267.000.

Barker, Julius A., Jr.: *See—*
Bingman, John W.; and Barker, Julius A., Jr., 4,313,707, Cl. 414-409.000.

Barley, Geoffrey W., to UOP Inc. Seat having a movable lumbar support. 4,313,637, Cl. 297-284.000.

Barnes, Norman S.; and Mogle, Rodman A., to General Electric Company. Molybdenum substrate thick film circuit. 4,313,262, Cl. 29-840.000.

Barraclough, Ronald; and Langley, Robert, to Ciba-Geigy Corporation. Process for the production of a pigment composition. 4,313,766, Cl. 106-288.00Q.

Barroso, Angel L. Method and apparatus for knotting automatically mouths of flexible packagings. 4,313,630, Cl. 289-1.500.

Barton, James L., to Societe Generale pour l'Emballage. Process for making glass with agglomerated refining agents. 4,313,747, Cl. 65-27.000.

Barton, John E. D.: *See—*
Serban, Alexander; Watson, Keith G.; and Barton, John E. D., 4,314,065, Cl. 548-222.000.

Basa, Kenneth B.; and Agusto, Robert G., to National Can Corporation. Colorants for lipid-based edible compositions and lipid-based compositions made therefrom. 4,313,966, Cl. 426-250.000.

BASF Wyandotte Corporation: *See—*
Markovs, Robert A., 4,314,038, Cl. 521-167.000.
Nassry, Assadullah; Maxwell, Jerrold F.; and Compton, John W., 4,313,836, Cl. 252-32.70E.
Thir, Basil; Newkirk, David D.; Eisenstein, Stephen E.; and Langdon, William K., 4,314,000, Cl. 428-265.000.

Bassett, David R.; and Wang, Alan E., to Union Carbide Corporation. Latex autodeposition coatings. 4,313,861, Cl. 260-29.60H.

Batcher, Kenneth E., to Goodyear Aerospace Corporation. Processing element for parallel array processors. 4,314,349, Cl. 364-716.000.

Batkov, Alexandr I.: *See—*
Gotovtseva, Ljubov A.; Konkova, Maia B.; Garbuz, Tatyana F.; Bunin, Oleg A.; Osminin, Evgeny A.; Zabavina, Nina A.; Ivanov, Alexei I.; Snopov, Vladimir P.; and Batkov, Alexandr I., 4,313,235, Cl. 8-149.100.

Battelle Development Corporation: *See—*
Goldberger, William M.; Epstein, Harold M.; and Parekh, Bhupendra K., 4,313,573, Cl. 241-1.000.

Bauer, LeRoy. Animal marker for preventing milk contamination. 4,313,271, Cl. 40-304.000.

Bauer, Walter; and Farber, Heinrich, to Agfa-Gevaert Aktiengesellschaft. Film cassette with an opening for exposing data on a film accommodated therein. 4,313,538, Cl. 206-455.000.

Bauer, Werner R.; and Smith, William N., to Robertshaw Controls Company. Control unit and electrical switch construction therefor and methods of making such a control unit and electrical switch construction. 4,314,122, Cl. 200-72.00A.

Baumbach, Bertram W., to Reliable Electric Company. Communications circuit line protector and method of making the same. 4,314,302, Cl. 361-119.000.

Baumbach, Bertram W., to Reliable Electric Company. Line protector for a communications circuit. 4,314,304, Cl. 361-124.000.

Baxter, G. Matthews. Golf tee and ball stick device. 4,313,604, Cl. 273-32.00A.

Baxter, Ivor R.: *See—*
Humphries, John M.; Baxter, Ivor R.; and Fripp, David G. F., 4,314,153, Cl. 250-231.0SE.

Baxter Travenol Laboratories, Inc.: *See—*
Bilstad, Arnold C.; and Foley, John T., 4,314,143, Cl. 219-497.000.
Radlick, Phillip C., 4,314,087, Cl. 568-842.000.

Bayer Aktiengesellschaft: *See—*
Bier, Peter, 4,313,903, Cl. 264-328.100.
Boden, Heinrich; Muller, Heinz; and Sowade, Bernd, 4,313,909, Cl. 422-133.000.

Klenk, Herbert; Wirthwein, Rolf; Siekmann, Gerd; and Schwerdtel, Wulf, 4,313,879, Cl. 260-343.000.
Panek, Peter; Gutsche, Walter; and Woditsch, Peter, 4,313,913, Cl. 423-82.000.
Vente, Paul; Juffa, Richard; Seidenschnur, Dieter; and Knipp, Ulrich, 4,313,482, Cl. 152-330.00R.

BBC Brown, Boveri & Company Limited: *See*—
Galliker, Josef, 4,314,321, Cl. 363-10.000.
Gessinger, Gernot, 4,314,007, Cl. 428-614.000.
Marek, Alois, 4,314,200, Cl. 324-117.00R.

Bearden, Roby, Jr.: *See*—
Aldridge, Clyde L.; and Bearden, Roby, Jr., 4,313,818, Cl. 208-108.000.

Beatrice Foods Co.: *See*—
Greenspan, Joseph, 4,313,963, Cl. 426-58.000.

Becker, Joseph A.: *See*—
Heitman, Christopher J.; and Becker, Joseph A., 4,313,349, Cl. 74-507.000.

Becker, Ronald K.; and Korb, Donald R., to Syntex (U.S.A.) Inc. Method and apparatus for manufacturing plastic lenses. 4,313,355, Cl. 82-1.00C.

Beckstead, Leo W.: *See*—
Huggins, Dale K.; Queneau, Paul B.; and Beckstead, Leo W., 4,313,914, Cl. 423-58.000.

Bednar, John M.: *See*—
Petersen, Clifford W.; Bednar, John M.; Hocker, Edwin J., Jr.; Gauger, David H.; and Henderson, James M., 4,314,365, Cl. 367-82.000.

Behle, Gunter R.: *See*—
Wempe, Richard J.; and Behle, Gunter R., 4,313,591, Cl. 251-144.000.

Beitchman, Burton D.; and Mascioli, Rocco L., to Air Products and Chemicals, Inc. Hetero nitrogen catalysts. 4,314,037, Cl. 521-125.000.

Belisomi, Pietro, to Italiana S.p.A. Indesit Industria Elettromdomestici. Television tuning system. 4,314,375, Cl. 455-158.000.

Belke, William H.; Goloff, Alexander; and Grim, George B., to Caterpillar Tractor Co. Rotating fluidized bed heat exchanger. 4,313,301, Cl. 60-39.51H.

Bell & Howell Company: *See*—
Whittle, William C., 4,314,296, Cl. 360-109.000.

Bell Telephone Laboratories, Incorporated: *See*—
Bobeck, Andrew H., 4,314,358, Cl. 365-19.000.
Fleming, Mills L.; and Mullin, Francis J., 4,314,092, Cl. 174-38.000.
Mollenauer, Linn F., 4,314,211, Cl. 372-32.000.
Toy, Wing N., 4,314,350, Cl. 364-740.000.

Bellicardi, Francesco; and Molinari, Franco, to Weber S.p.A. Electromagnetically actuated injector for internal combustion engine. 4,313,571, Cl. 239-585.000.

Bemis, Lester E.; Kincaid, Charles M.; and White, Hugh L., to American Can Company. Method and apparatus for cleaning containers with an ionized gas blast. 4,313,767, Cl. 134-1.000.

Ben-Dror, Jonathan: *See*—
Vardi, Isaih; Kimchi, Yigal; and Ben-Dror, Jonathan, 4,313,316, Cl. 62-475.000.

Bengtsson, Folke, to Carl Johan Lockmans Ingenjorsbyra. Plate heat exchanger. 4,313,494, Cl. 165-148.000.

Benham, Albert A., to Champion International Corporation. Multiple pocket, expandable envelope, and blank and method for forming same. 4,313,558, Cl. 229-72.000.

Bennett, Richard N.; and Buckley, Lawrence W., to National Instrument Company, Inc. Dual lane filling machine. 4,313,476, Cl. 141-59.000.

Benomelli S.p.A.: *See*—
Redaelli, Claudio, 4,313,880, Cl. 260-345.200.

Benyon, Carl W., Jr.; and O'Neill, John J., Jr., to RCA Corporation. Method of reducing edge current leakage in N channel silicon-on-sapphire devices. 4,313,809, Cl. 204-192.00C.

Berger, Johann: *See*—
Reiter, Erich, 4,313,473, Cl. 139-432.000.

Berger, Josef: *See*—
Reiter, Erich, 4,313,473, Cl. 139-432.000.

Berger, Mitchell H.; Matzner, Markus; and Tibbitt, James M., to Union Carbide Corporation. Process for preparing polyarylates. 4,314,051, Cl. 528-179.000.

Bergeron, David L.; and Stephens, Geoffrey B., to International Business Machines Corporation. Dense high performance JFET compatible with NPN transistor formation and merged BIFET. 4,314,267, Cl. 357-43.000.

Bergfeld, Manfred: *See*—
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Bergwerksverband GmbH: *See*—
Kucharzyk, Werner; and Rohde, Wolfgang, 4,313,704, Cl. 414-199.000.

Berisch, Volker, to ITT Industries, Inc. Control valve for vehicle brake systems having two brake circuits. 4,313,642, Cl. 303-6.00C.

Berlin Industries, Inc.: *See*—
Foffel, John F., 4,313,557, Cl. 229-68.00R.

Berman, Marvin. Method and apparatus for eyeglass lens adjustment and retention. 4,313,652, Cl. 351-106.000.

Bernard, Gary A.: *See*—
Richmond, James M.; Reck, Richard A.; and Bernard, Gary A., 4,313,895, Cl. 260-501.150.

Berney, Jean-Claude, to Berney, Jean-Claude. Analog display device. 4,314,146, Cl. 235-92.0EA.

Bernstein, William L.; and Del Principe, Robert M., to Mattel, Inc. Electronic card game simulator. 4,314,336, Cl. 364-411.000.

Bertino, Clarence D.; Hill, Robert W.; and Schulz, J. Gustav, to Gulf Oil Corporation. Bis-quinizarin compounds. 4,313,887, Cl. 260-367.000.

Beschke, Helmut; Friedrich, Heinz; Muller, Klaus-Peter; and Schreyer, Gerd, to Deutsche Gold- und Silber-Scheindeanstalt vormals Roessler. Process for the production of nicotinamide. 4,314,064, Cl. 546-317.000.

Best Lock Corporation: *See*—
Best, Walter E.; and Foshee, William R., 4,313,320, Cl. 70-134.000.

Best, Walter E.; and Foshee, William R., to Best Lock Corporation. Rim lock with classroom function. 4,313,320, Cl. 70-134.000.

BHS-Bayerische Berg- Hutten- und Salzwerke Aktiengesellschaft: *See*—
Mosburger, Hans, 4,313,600, Cl. 271-203.000.

Bickel, Samuel H., to Atlantic Richfield Company. Long sweep vibroseis record production. 4,314,364, Cl. 367-43.000.

Bie, Norman, Jr. Internal combustion engine. 4,313,403, Cl. 123-53.00B.

Biehl, Reinhard; and Schmalbein, Dieter, to Bruker Analytische Messtechnik GmbH. Resonator for electron spin resonance experiments. 4,314,204, Cl. 324-316.000.

Bier, Peter, to Bayer Aktiengesellschaft. Process for injection molding of polyethylene terephthalate compositions at reduced mold temperature. 4,313,903, Cl. 264-328.100.

Biggs, Aubrey H.; Slattery, Ian; and Workman, Jack G., to Spencer Wright Industries, Inc. Modular hook assembly for staggered needle cut pile tufting machines. 4,313,388, Cl. 112-79.00R.

Bilstad, Arnold C.; and Foley, John T., to Baxter Travenol Laboratories, Inc. Blood warming apparatus with digital display and monitoring circuit. 4,314,143, Cl. 219-497.000.

Bindernagel, Ali; and Blos, Ernst O., to Kocks Technik GmbH & Co. Continuous rolling lines and methods for rolling wires or bars. 4,313,326, Cl. 72-230.000.

Bingman, John W.; and Barker, Julius A., Jr. Side loading apparatus for trash collection system. 4,313,707, Cl. 414-409.000.

Biotek, Inc.: *See*—
Babb, Albert L.; and Parks, Richard E., 4,313,439, Cl. 128-214.00F.

Birdsong, William D., Jr. Apparatus for manufacturing gas-filled balls with precision. 4,313,289, Cl. 53-84.000.

Bismarck, Otto H., to RCA Corporation. Fast level shift circuits. 4,314,166, Cl. 307-475.000.

Bitsch, Rainer; Diessner, Armin; and Muller, Bruno. Overvoltage protection device. 4,314,303, Cl. 361-120.000.

Black, Robert B. Technique for handling viscous liquids in transit or storage. 4,313,399, Cl. 122-4.00R.

Blake, Charles R., to General Electric Company. Thermoelectric temperature stabilized battery system. 4,314,008, Cl. 429-8.000.

Blake, John H.: *See*—
Gerow, Gordon P.; and Blake, John H., 4,313,372, Cl. 99-483.000.

Blanc, Jean M., to Swiss Aluminium Ltd. Arrangement of busbars for electrolytic cells. 4,313,811, Cl. 204-243.00M.

Blasewitz, Albert G.: *See*—
Cowan, Richard G.; and Blasewitz, Albert G., 4,313,845, Cl. 252-630.000.

Bleile, Henry R.: *See*—
Neal, Jesse R., Jr.; and Bleile, Henry R., 4,313,860, Cl. 260-27.00R.

Blincoe, Richard A.; and Hrusch, Louis C., to Pneumo Corporation. Dual cylinder linear servo motor. 4,313,364, Cl. 91-176.000.

Block, Thomas E.; and Scherzer, Julius, to Filtrol Corporation. Method of producing pseudoboehmites. 4,313,923, Cl. 423-628.000.

Blos, Ernst O.: *See*—
Bindernagel, Ali; and Blos, Ernst O., 4,313,326, Cl. 72-230.000.

Blount, David H. Broken-down organic lignin-cellulose silicate polymers. 4,313,857, Cl. 260-13.000.

Bobeck, Andrew H., to Bell Telephone Laboratories, Incorporated. Segmented, conductor access, magnetic bubble memory. 4,314,358, Cl. 365-19.000.

Boden, Heinrich; Muller, Heinz; and Sowade, Bernd, to Bayer Aktiengesellschaft. Method and an apparatus for producing a reaction mixture for forming solid or cellular substances from flowable reactants and optionally fillers. 4,313,909, Cl. 422-133.000.

Bodor, Nicholas S.; Sloan, Kenneth B.; and Pogany, Stefano A., to INTERx Research Corp. Novel sypathomimetic amine prodrugs. 4,313,956, Cl. 424-301.000.

Bodor, Nicolae S., to Merck & Co., Inc. Soft quaternary surface active agents. 4,313,889, Cl. 260-404.000.

Boehringer Ingelheim KG: *See*—
Walther, Gerhard; Schneider, Claus S.; Weber, Karl-Heinz; and Fugner, Armin, 4,313,931, Cl. 424-45.000.

Boettger, Heinz G.: *See*—
Kuppermann, Aron; Dreyer, William J.; Giffin, Charles E.; and Boettger, Heinz G., 4,314,156, Cl. 250-281.000.

Bok, Dennis E.; Brown, Mark E.; Hahn, Steven R.; Huliba, David A.; and Wysinski, Thomas M., to Mead Corporation, The. Ink supply system for an ink jet printer. 4,314,264, Cl. 346-140.00R.

Boldebuck, Edith M.: *See*—
Banucci, Eugene G.; and Boldebuck, Edith M., 4,314,047, Cl. 528-26.000.

Boldt, Donald M.; and McClellan, Elton, to Keller Corporation, The. System for transport of mixtures of solid particulate fuel and air, and rotary distributor suitable for use therein. 4,313,386, Cl. 110-104.00R.

Bollyky, Laszlo J.; and Rauhut, Michael M., to American Cyanamid Company. Superior oxalate ester chemical lighting system. 4,313,843, Cl. 252-188.3CL.

Bolth, Franklin A.: *See*—
Fischer, Arthur H.; Strow, Lawrence E.; and Bolth, Franklin A., 4,313,838, Cl. 252-60.000.
Bommart, Patrick, to C. Delachaux, S.A. Setting arrangement for alignment and gap between two rail ends. 4,313,382, Cl. 104-1.00R.
Bonner, Edgar L.; and Faerber, Nelson A. Editing system for video apparatus. 4,314,285, Cl. 360-33.000.
Boodman, Leon; and Malone, James P. Wind turbine generator for electrical powered vehicles. 4,314,160, Cl. 290-55.000.
Boratgis, James P.; and Pittman, Earle S. Temperature control with undercool protection. 4,313,308, Cl. 62-126.000.
Borg-Warner Corporation: *See*—
Cole, Edward H., Jr.; Kern, John M.; and Wyckoff, James A., 4,313,730, Cl. 474-201.000.
Borowski, Kurt; and Wagensonner, Eduard, to Agfa-Gevaert AG. Weighting of the scene light signal during the shutter opening operation. 4,313,656, Cl. 354-29.000.
Borowski, Kurt: *See*—
Heil, August; Borowski, Kurt; Cocron, Istvan; and Huber, Theodor, 4,313,655, Cl. 354-25.000.
Borton, Roland K.: *See*—
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Botyan, Viktor V.: *See*—
Chachin, Viktor N.; Kolos, Vladimir K.; Botyan, Viktor V.; Luzgin, Vladimir I.; and Kashperko, Vyacheslav A., 4,313,334, Cl. 72-453.100.
Bouron, Jean-Pierre: *See*—
Postel, Michel; and Bouron, Jean-Pierre, 4,314,351, Cl. 364-720.000.
Boyanich, Joseph E., to Ruderman, Alan, a part interest. Air conditioner/heat pump conversion apparatus. 4,313,314, Cl. 62-324.100.
Boyd, Violet; Fishwick, Brian R.; and Glover, Brian, to Imperial Chemical Industries Limited. Disperse monoazo dyestuffs. 4,313,874, Cl. 260-207.000.
Boyd, Winnett. Brake actuator for bicycles and the like. 4,313,530, Cl. 192-41.00S.
Boyle, Daniel J.; and Jaeschke, Harold R., to Champion International Corporation. Carton having foldable bottom and carton blank. 4,313,556, Cl. 229-38.000.
Boys, Donald: *See*—
Graves, Walter E., Jr.; Boys, Donald; and Turner, Frederick T., 4,313,815, Cl. 204-298.000.
Brabets, Robert I.: *See*—
Massey, Lester G.; Brabets, Robert I.; and Abel, William A., 4,313,737, Cl. 44-1.00C.
Bradford, Fairey S.: *See*—
Stokes, W. Fred; Bradford, Fairey S.; and Strobel, Nancy S., 4,313,605, Cl. 273-85.00C.
Brandell, John T., to Halliburton Service.. Downhole pump with pressure limiter. 4,313,495, Cl. 166-53.000.
Brandt-Pra, Inc.: *See*—
DiBlasio, John A., 4,313,598, Cl. 271-124.000.
Branson International Plasma Corporation: *See*—
Davies, John T.; and Reichelderfer, Richard F., 4,313,783, Cl. 156-643.000.
Branson Ultrasonics Corporation: *See*—
Mims, Bruce L., 4,313,778, Cl. 156-358.000.
Braswell, Charles D.: *See*—
Wartinger, Raymond C.; Braswell, Charles D.; Buchalter, Neal S.; Daughton, John W.; and Ellis, Robert G., 4,313,673, Cl. 355-14.00R.
Breidenstein, Charles J.; and Barbe, Charles A., III, to Redcom Laboratories, Inc. System for the testing of telephone switching systems. 4,314,110, Cl. 179-175.20R.
Breitenbach, Otto, to Kabel-Und Metallwerke Gutehoffnungshuette A.G. Prefabricated stator windings. 4,314,168, Cl. 310-13.000.
Brewer, Richard J.; and Wininger, Brice S., to Eastman Kodak Company. Catalyst for and method of preparing cellulose esters. 4,314,056, Cl. 536-63.000.
Bricaud, Herve: *See*—
Seytre, Bruno; and Bricaud, Herve, 4,314,311, Cl. 361-386.000.
Bricker, Bernard L. Rolling support platform device for writing, drawing and the like. 4,313,585, Cl. 248-118.500.
Briggs, Eugene C.; and Shaftner, Robert F., to Koehring Company. Portable space heater. 4,313,417, Cl. 126-110.00B.
Briggs, Henry R., to Rolls-Royce Limited. Mounting of rotor assemblies. 4,313,712, Cl. 416-2.000.
Briglia, Donald D.: *See*—
Paitich, Ronald M.; and Briglia, Donald D., 4,314,205, Cl. 324-460.000.
Briska, Marian; Metzger, Gert; and Thiel, Klaus P., to International Business Machines Corporation. Method for removing borosilicate and boron rich oxides from a silicon body prior to doping silicon bodies with a $SiB_6$ solid source. 4,313,773, Cl. 148-188.000.
Bristol-Myers Company: *See*—
Miyaki, Takeo; Tenmyo, Osamu; Konishi, Masataka; and Kawaguchi, Hiroshi, 4,314,028, Cl. 435-77.000.
Britner, George F.; and Zivic, John A., to Phelps Dodge Industries, Inc. Solar energy absorbing-heat exchanger device. 4,313,430, Cl. 126-446.000.
Brockmann, Heinrich. Apparatus for regulating the air pressure in tires of cross-country vehicles. 4,313,483, Cl. 152-416.000.
Brogardh, Torgny; and Sander, Lars, to Asea Aktiebolag. Fiber optical temperature measurement devices. 4,313,344, Cl. 73-355.00R.
Brown, Earl T.; and Cavill, Barry R., to International Business Machines Corporation. Microcomputer control of ribbon drive for printers. 4,313,683, Cl. 400-225.000.
Brown, Gaylord W., to Sweetheart Plastics, Inc. Dynamically balanced trim press. 4,313,358, Cl. 83-97.000.
Brown, James P.; and Laughlin, Robert G., to Procter & Gamble Company, The. Oxaalkanoate anti-ulcer compounds. 4,314,060, Cl. 544-171.000.
Brown, Leland T., to Motorola Inc. Current limiting circuit. 4,314,196, Cl. 323-315.000.
Brown, Mark E.: *See*—
Bok, Dennis E.; Brown, Mark E.; Hahn, Steven R.; Huliba, David A.; and Wysinski, Thomas M., 4,314,264, Cl. 346-140.00R.
Brown, William D.; and Whitman, Hobart A., III, to Olin Corporation. Spatially distributed electrostatic perforation of moving webs. 4,314,142, Cl. 219-384.000.
Brownlee Labs, Inc.: *See*—
Brownlee, Robert, 4,313,828, Cl. 210-198.200.
Brownlee, Robert, to Brownlee Labs, Inc. High pressure tubing coupler. 4,313,828, Cl. 210-198.200.
Bruker Analytische Messtechnik GmbH: *See*—
Biehl, Reinhard; and Schmalbein, Dieter, 4,314,204, Cl. 324-316.000.
Brumm, Richard S., to Grove Valve and Regulator Company. Pilot pressure intensifier. 4,313,461, Cl. 137-489.000.
Brust, Gerhard, to Siemens Aktiengesellschaft. Removable container gimbals mounting on a transporting car container. 4,313,701, Cl. 410-52.000.
BSL Corporation: *See*—
Gidge, Kenneth N.; and Richard, Henry J., 4,313,485, Cl. 160-328.000.
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Buchs, Willy: *See*—
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Buckley, John D.; Swaim, Robert J.; and Fox, Robert L., to United States of America, National Aeronautics and Space Administration. One-step dual purpose joining technique. 4,313,777, Cl. 156-272.000.
Buckley, Lawrence W.: *See*—
Bennett, Richard N.; and Buckley, Lawrence W., 4,313,476, Cl. 141-59.000.
Budd Company, The: *See*—
Hull, Frederick H., 4,313,347, Cl. 73-669.000.
Buettiker, Paul, to Combustion Engineering, Inc. Guide post modification for nuclear fuel assembly. 4,313,796, Cl. 376-353.000.
Buffet, Jacques, to Cardiofrance - Compagnie Francaise d'Electrocardiologie. Method of adjusting an implantable cardiac stimulator, and adjustment programmer and stimulator for carrying out same. 4,313,441, Cl. 128-419.0PG.
Bundy, Gordon L., to Upjohn Company, The. 11a-Methano $TXA_2$ amides. 4,313,877, Cl. 260-333.000.
Bunin, Oleg A.: *See*—
Gotovtseva, Ljubov A.; Konkova, Maia B.; Garbuz, Tatyana F.; Bunin, Oleg A.; Osminin, Evgeny A.; Zabavina, Nina A.; Ivanov, Alexei I.; Snopov, Vladimir P.; and Batkov, Alexandr I., 4,313,235, Cl. 8-149.100.
Bunker Ramo Corporation: *See*—
Scarbrough, Alfred D., 4,314,356, Cl. 364-900.000.
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Burlington Industries, Inc.: *See*—
Teague, Edward W.; Graham, Louis A.; and McConnell, Bobby L., 4,313,732, Cl. 8-541.000.
Burney, Harry S.; and Ezzell, Bobby R., to Dow Chemical Company, The. Chlorine cell catholyte series flow. 4,313,805, Cl. 204-98.000.
Burns, Ivan A.; and Hochmuth, William R., to ACF Industries, Incorporated. Restricted movement valve seats for an expanding gate valve. 4,313,458, Cl. 137-327.000.
Burns, Lyle D.: *See*—
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Burron Medical Inc.: *See*—
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Freeman, Ian B.; Rooney, John O.; and Hardwick, John F., 4,314,287, Cl. 360-51.000.
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Henderson, Donald L., Sr., 4,313,253, Cl. 29-571.000.
Nelson, Edward I., 4,314,113, Cl. 200-5.00R.
Ragle, Herbert U., 4,314,290, Cl. 360-77.000.
Burrus, Thomas W., to Rockwell International Corporation. Preamplifier for ADF loop antenna. 4,314,252, Cl. 343-113.00R.
Bussjager, Rudy C.: *See*—
Chrostowski, Ronald F.; Bussjager, Rudy C.; and del Toro, James J., 4,313,313, Cl. 62-278.000.
C. A. Greiner & Sohne GmbH: *See*—
Habich, Hans-Joachim, 4,314,030, Cl. 435-296.000.
C. Delachaux, S.A.: *See*—
Bommart, Patrick, 4,313,382, Cl. 104-1.00R.
Caillet, Pierre; and Romeas, Rene, to Thomson-Brandt. Digital coding process for recording sound channels with a television signal and apparatus realizing this process. 4,314,369, Cl. 371-69.000.
Cairns, Walter J.; and Van Vloten, Curtis P., to Arthur D. Little, Inc. Apparatus for providing an array of fine liquid droplets particularly suited for ink-jet printing. 4,314,259, Cl. 346-75.000.

Calderoni, Gabriele; and Gavina, Gian A., to U.S. Philips Corporation. Compressor refrigeration circuits. 4,313,315, Cl. 62-475.000.
Caldwell, John R., to Xerox Corporation. Reproduction machine with a pivotal stapling device. 4,313,670, Cl. 355-3.00R.
California Institute of Technology: *See*—
Kuppermann, Aron; Dreyer, William J.; Giffin, Charles E.; and Boettger, Heinz G., 4,314,156, Cl. 250-281.000.
Cameron Iron Works, Inc.: *See*—
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Campagne, Constant J. V. L., to Luycks Producten B.V. Preparation of concentrated natural vinegar. 4,313,960, Cl. 426-17.000.
Campbell, Carl M., Jr., to Burroughs Corporation. Authenticator device for precluding compensating text modifications in transmitted messages. 4,314,097, Cl. 178-22.080.
Canon Kabushiki Kaisha: *See*—
Minoura, Kazuo; Kiyohara, Takehiko; and Uchiyama, Haruo, 4,314,154, Cl. 250-235.000.
Morikawa, Teruo; and Murata, Shinji, 4,313,649, Cl. 350-252.000.
Saito, Syuichiro; Suzuki, Ryoichi; and Uchiyama, Takashi, 4,313,659, Cl. 354-234.000.
Sugiura, Yoji; Date, Nobuaki; Suzuki, Ryoichi; and Saito, Syuichiro, 4,313,658, Cl. 354-152.000.
Takahashi, Tohru; Toyono, Tsutomu; Kanbe, Junichiro; Nakamura, Shunji; and Tamura, Yasuyuki, 4,314,017, Cl. 430-109.000.
Tazaki, Shigemitsu; Okamura, Shigeru; and Kyogoku, Hiroshi, 4,313,684, Cl. 400-322.000.
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Carau, Frank P., Sr.; Hetzel, Henry T.; and Tremblay, Michael A., to Hewlett-Packard Company. Pre-load apparatus and method for travelling wave digitizer. 4,314,096, Cl. 178-19.000.
Cardiac Pacemakers, Inc.: *See*—
Knudson, Mark B.; and Amundson, David C., 4,313,442, Cl. 128-419.0PG.
Cardinal, Raymond F.; and Walker, Jack M., to Raychem Corporation. Devices comprising conductive polymers. 4,314,230, Cl. 338-314.000.
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Buffet, Jacques, 4,313,441, Cl. 128-419.0PG.
Carl Johan Lockmans Ingenjorsbyra: *See*—
Bengtsson, Folke, 4,313,494, Cl. 165-148.000.
Carl Walther GmbH: *See*—
Ludwig, Walter; and Schmid, Franziska, deceased, 4,313,274, Cl. 42-70.00F.
Carley, Adam L. Fluid jet apparatus. 4,314,263, Cl. 346-140.00R.
Carmichael, Dumont M., to Applied Magnetics Corporation. Excited frame, vibratory conveying apparatus for moving particulate material. 4,313,535, Cl. 198-766.000.
Caro, Charles R., to CWM Corporation. Electrical power generation apparatus and method utilizing electron beam discharge. 4,314,192, Cl. 322-2.00R.
Carr, William N., to Recognition Equipment Incorporated. Signal processing with random address data array and charge injection output. 4,314,348, Cl. 364-604.000.
Carrier Corporation: *See*—
Chrostowski, Ronald F.; Bussjager, Rudy C.; and del Toro, James J., 4,313,313, Cl. 62-278.000.
Carsac, Claude R.: *See*—
de Sivry, Bruno J. M.; Carsac, Claude R.; and Hamon, Jean-Pierre, 4,314,135, Cl. 29-121.0EU.
Cases, Jean M.; Valence, Georges; and Lietard, Olivier, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method for recovering the lead and zinc values in secondary scrubber muds from blast furnace gases. 4,313,822, Cl. 209-233.000.
Cassella Aktiengesellschaft: *See*—
Engelhardt, Friedrich; Hintermeier, Karl; Ribka, Joachim; Dursch, Walter; and Rupp, Walter, 4,314,052, Cl. 528-287.000.
Heinrich, Ernst; and Ribka, Joachim, 4,313,872, Cl. 260-152.000.
Castera, Jean P.; Hartemann, Pierre; and Dupont, Jean M., to Thomson-CSF. Magnetostatic-wave device comprising a conducting strip exchange structure. 4,314,214, Cl. 333-141.000.
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Muntjanoff, John R.; and Lanchantin, Charles E., Jr., 4,313,633, Cl. 294-88.000.
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Mairy, Bernard, 4,313,975, Cl. 427-236.000.
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CGR-MeV: *See*—
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Tracy, David J.; Wood, Lindley S.; and Chakrabarti, Paritosh M., 4,313,764, Cl. 106-188.000.
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Johnson, Harlan B.; and Chamberlin, Ronald D., 4,313,813, Cl. 204-263.000.
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Benham, Albert A., 4,313,558, Cl. 229-72.000.
Boyle, Daniel J.; and Jaeschke, Harold R., 4,313,556, Cl. 229-38.000.
Hain, Paul, 4,313,899, Cl. 264-40.100.
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Champlin, H. H.: *See*—
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Gras, Rainer; and Wolf, Elmar, 4,313,876, Cl. 260-239.30R.
Cheng, Paul J., to Phillips Petroleum Co. Carbon black process. 4,313,921, Cl. 423-456.000.
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Honnen, Lewis R., 4,313,680, Cl. 366-337.000.
Mayer, Jerome F.; and Miller, Stephen J., 4,313,817, Cl. 208-89.000.
Scott, John W., 4,313,848, Cl. 252-418.000.
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Childs, Eric G.; and Just, Friedrich E., to Cameron Iron Works, Inc. Wellhead shearing apparatus. 4,313,496, Cl. 166-55.000.
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Lin, Tung-Yen; Yang, Yue-Chyou; and Chow, Philip Y., 4,313,902, Cl. 264-228.000.
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Good, Garry R.; and Anderson, Charles W., 4,313,503, Cl. 172-140.000.
Chrostowski, Ronald F.; Bussjager, Rudy C.; and del Toro, James J., to Carrier Corporation. Apparatus and method for defrosting a heat exchanger of a refrigeration circuit. 4,313,313, Cl. 62-278.000.
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Da Silva, Jose T., 4,313,449, Cl. 130-27.00T.
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Huebner, Charles F.; and Gschwend, Heinz W., 4,313,955, Cl. 424-278.000.
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Wiederkehr, Rene; and Scartazzini, Riccardo, 4,313,945, Cl. 424-246.000.

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Crewe, David W.; and Hill-Harriss, Stephen P., 4,314,329, Cl. 364-141.000.
Cindon Research Inc.: *See*—
Sharvit, Martin M., 4,314,108, Cl. 179-90.00D.
City University, The: *See*—
Penny, William A.; and Slater, Robert A. C., 4,313,332, Cl. 72-406.000.
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Clark, Becky J., to Burroughs Corporation. Four-wire speed independent arbiter switch for digital communication networks. 4,314,233, Cl. 340-825.020.
Clements, Harold J. Sealing devices. 4,313,609, Cl. 277-34.300.
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Cliff, John O., to Pittsburgh-Des Moines Corporation. Removable condensate collector for elevated water storage facilities. 4,313,457, Cl. 137-312.000.
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Gavin, Derek G.; and Jones, Michael A., 4,313,852, Cl. 252-439.000.
Cocco, Eugene R., to Western Electric Company, Inc. Telephone cord having braided outer jacket. 4,313,645, Cl. 339-103.00M.
Cockerill, Societe Anonyme: *See*—
Focant, Jean, 4,313,565, Cl. 239-132.300.
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Collet, Theodore D. A. Device for holding, drying and repetitively dispensing a bar of soap. 4,313,537, Cl. 206-77.100.
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Mabery, Thomas L.; and Jackson, Francis B., 4,314,130, Cl. 219-58.000.
Comitato Nazionale per l'Energia Nucleare: *See*—
Conti, Ruggero; and Imperiali, Franco, 4,314,323, Cl. 363-71.000.
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Hanell, Sigmund H.; and Kreutel, Randall W., Jr., 4,314,250, Cl. 343-100.0SA.
Compact Video Sales, Inc.: *See*—
Sayovitz, Michael G., 4,314,253, Cl. 343-765.000.
Compagnie Francaise des Petroles: *See*—
de Sivry, Bruno J. M.; Carsac, Claude R.; and Hamon, Jean-Pierre, 4,314,135, Cl. 29-121.0EU.
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Martinage, Bernard, 4,314,261, Cl. 346-108.000.
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Lazzari, Jean-Pierre, 4,314,297, Cl. 360-113.000.
Compak Systems, Inc.: *See*—
Volkert, John K.; Penick, Ib; and Volkert, Robert B., 4,313,270, Cl. 40-124.100.
Comparetto, John E. Method for opening shellfish. 4,313,241, Cl. 17-48.000.
Compton, John W.: *See*—
Nassry, Assadullah; Maxwell, Jerrold F.; and Compton, John W., 4,313,836, Cl. 252-32.70E.
Conroy, James T.: *See*—
Frye, Robert B.; and Conroy, James T., 4,313,979, Cl. 427-387.000.
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Massey, Lester G.; Brabets, Robert I.; and Abel, William A., 4,313,737, Cl. 44-1.00C.
Container Corporation of America: *See*—
Hart, Joseph J.; and Desmond, John D., 4,313,540, Cl. 206-588.000.
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Feier, Markus; Frey, Raymond; and Marti, Ulrich, 4,314,346, Cl. 364-555.000.
Cooper, John C.: *See*—
Schumacher, Berthold W.; and Cooper, John C., 4,314,134, Cl. 219-121.0EW.
Cooper, William T., to Phillips Petroleum Co. Carbon black agglomerate production. 4,313,920, Cl. 423-449.000.
Cooperative Landbouw aan- en verkoopcombinatie, B.A. "C.L.C.": *See*—
Locker, Jan A. K., 4,313,823, Cl. 209-369.000.
Copen, Dennis E. Automotive exhaust system incorporating venturi to reduce back pressure. 4,313,523, Cl. 181-263.000.
Corgey, Norman R.: *See*—
Wilson, Hill D.; and Corgey, Norman R., 4,314,129, Cl. 219-58.000.
Corning Glass Works: *See*—
Sanford, Leon M.; and Tick, Paul A., 4,314,031, Cl. 501-44.000.
Cote, Raymond A.: *See*—
Roberts, Harry H.; and Cote, Raymond A., 4,313,542, Cl. 206-611.000.
Couch, Robert W.: *See*—
Matthews, John C.; and Couch, Robert W., 4,313,969, Cl. 427-44.000.
Coughran, Samuel J., Jr., to Rome Industries, Inc. Draw shear. 4,313,479, Cl. 144-3.00D.
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Hasquenoph, Jean H.; and Coutin, Pierre F., 4,313,582, Cl. 244-137.00R.
Covington, Edward L.; and Self, Herman D. Digital radio communications system with high noise immunity. 4,314,371, Cl. 375-58.000.
Cowan, Richard G.; and Blasewitz, Albert G., to United States of America, Energy. System for chemically digesting low level radioactive, solid waste material. 4,313,845, Cl. 252-630.000.
Cowie, Christopher G.: *See*—
Curnow, Richard D.; and Cowie, Christopher G., 4,314,003, Cl. 428-294.000.
Cox, John W., to Transworld Drilling Company. Submersible pipe installation systems. 4,313,694, Cl. 405-168.000.
Crackel, Lawrence E.; and Oglesby, Lloyd S. Spectral convertor. 4,313,425, Cl. 126-438.000.
Cramer, Charles W., to Cramer Products, Inc. Ankle stabilizer. 4,313,433, Cl. 128-80.00H.
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Cramer, Charles W., 4,313,433, Cl. 128-80.00H.
Cremona, Angelo. Log shearing device. 4,313,481, Cl. 144-209.00B.
Crewe, David W.; and Hill-Harriss, Stephen P., to Cincinnati Milacron Inc. Method and apparatus for using a computer numerical control to control a machine cycle of operation. 4,314,329, Cl. 364-141.000.
Crone, John M., Jr.; and Suggitt, Robert M., to Texaco Inc. Preparation of 1-methyl-3,5-diisopropyl benzene from charge streams containing diisopropyl toluene. 4,314,091, Cl. 585-486.000.
Crooks, Graham R., to Imperial Chemical Industries Limited. Process for the production of an aromatic dicarboxylic acid. 4,314,073, Cl. 562-416.000.
Crowell, Russell T., to United States of America, National Aeronautics and Space Administration. Method for refurbishing and processing parachutes. 4,313,291, Cl. 53-429.000.
CSS International Corporation: *See*—
Lulejian, Donald A.; Faure, Alphonse W.; and Fijalkowski, Eugene F., 4,313,750, Cl. 65-160.000.
Csurgay, Gregory: *See*—
Wise, Stanley S.; and Csurgay, Gregory, 4,313,641, Cl. 303-3.000.
Cucinella, Salvatore: *See*—
Dozzi, Giovanni; and Cucinella, Salvatore, 4,313,891, Cl. 260-448.0AD.
Cummings, James D. Pipe bending apparatus. 4,313,330, Cl. 72-307.000.
Cupper, Robert A.: *See*—
Chu, Nan S.; Clinton, Nye A.; Cupper, Robert A.; Wolf, Philip F.; and Stanley, Priscilla B., 4,313,890, Cl. 260-410.600.
Curnow, Richard D.; and Cowie, Christopher G., to Union Carbide Corporation. Method of incorporating multifilament strands of carbon fibers into cement to produce reinforced structures having improved flexural strengths. 4,314,003, Cl. 428-294.000.
Cutler, John H.: *See*—
Walker, Loren H.; and Cutler, John H., 4,314,190, Cl. 318-798.000.
Cvetnic, Milan: *See*—
Ledwinka, Erich; and Cvetnic, Milan, 4,313,518, Cl. 180-233.000.
CWM Corporation: *See*—
Caro, Charles R., 4,314,192, Cl. 322-2.00R.
Dabeaux, Michel; and Tyrtoff, Nikita, to Produits Chimiques de la Montagne Noire. Method for the manufacture of phosphoric acid by the wet process. 4,313,915, Cl. 423-167.000.
Dagiel, Richard T., to Aetna Bearing Company. Thrust bearing assembly. 4,313,644, Cl. 308-233.000.
Daigle, Michael A.: *See*—
Richards, Thomas E.; Harvey, James P.; and Daigle, Michael A., 4,313,919, Cl. 423-321.00R.
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Shimizu, Hiroshi; Daigo, Toshiyuki; and Azuma, Hideo, 4,313,832, Cl. 210-663.000.
Daimler-Benz Aktiengesellschaft: *See*—
Hailer, Gottfried, 4,313,619, Cl. 280-691.000.
Luckel, Joachim; and Povel, Rolf, 4,313,365, Cl. 91-372.000.
Resch, Reinhard, 4,313,303, Cl. 60-556.000.
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Atoji, Hitomi; and Yamada, Mitsuhiko, 4,314,274, Cl. 358-80.000.
Dalton, Augustine I., Jr.; and Skinner, Ronald W., to Air Products and Chemicals, Inc. Cathodic protection of catalysts in a corrosive environment. 4,313,806, Cl. 204-147.000.

Damhuis, Gerardus J. M.: *See*—
Oude Elberink, Bernard H. M.; Damhuis, Gerardus J. M.; and Alink, Han, 4,314,247, Cl. 343-6.5LC.

Damiani, Martin R.: *See*—
Murdock, Keith C.; Damiani, Martin R.; and Durr, Frederick E., 4,314,061, Cl. 544-80.000.

Dana, James. Light-reflecting device. 4,314,318, Cl. 362-240.000.

Dane, Ferdinand: *See*—
Dries, Hubertus W. A. A.; and Dane, Ferdinand, 4,313,910, Cl. 422-147.000.

Danford, Jack D., to Danford, Jack D.; and Champlin, H. H. Grain cake breaker. 4,313,706, Cl. 414-326.000.

Daniels, Phillip D. Method and apparatus for assembling wood decks or the like. 4,313,688, Cl. 403-189.000.

Dantsiger, Alla Y.: *See*—
Fesenko, Evgeny G.; Dantsiger, Alla Y.; Filipiev, Viktor S.; Razumovskaya, Olga N.; Klevtsov, Alexandr N.; Lebedev, Vladimir N.; Grineva, Ljudmila D.; Rogach, Tatyana V.; Feronov, Anatoly D.; Akbaeva, Galina M.; Cheptsov, Evgeny I.; Panich, Anatoly E.; Lisitsina, Ljudmila G.; Lavrikova, Svetlana A.; Ochirov, Vasily A.; Dudkina, Svetlana I.; Nevsky, Alexandr N.; Aleshin, Vladimir A.; Kupriyanov, Mikhail F.; Baljunis, Evgeny S.; Mordanov, Boris P.; Zhitomirsky, Grigory A.; Feldman, Naum B.; Smazhevskaya, Ekaterina G.; and Devlikanova, Ravilya U., 4,313,839, Cl. 252-62.900.

Dardi, Louis E.; and Shankar, Srinivasan, to Howmet Turbine Components Corporation. Superalloy coating composition. 4,313,760, Cl. 106-1.120.

Darrow, John O. G.; and Pierro, Joseph J., to American Standard Inc. Test set for railway cab signal system. 4,314,234, Cl. 340-825.360.

Darrow, John O. G., to American Standard Inc. Fail-safe acknowledging circuit. 4,314,237, Cl. 340-502.000.

Darrow, John O. G., to American Standard Inc. Signal-powered receiver. 4,314,306, Cl. 361-182.000.

Dasibi Environmental Corporation: *See*—
Johns, Robert K.; Deist, Donald W.; and Houston, Owen M., 4,314,344, Cl. 364-500.000.

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Date, Nobuaki: *See*—
Sugiura, Yoji; Date, Nobuaki; Suzuki, Ryoichi; and Saito, Syuichiro, 4,313,658, Cl. 354-152.000.

Daughton, John W.; Gillett, Kenneth; Nelson, Frank; and Wilczek, Stephen P., to Xerox Corporation. Serial data communication system having simplex/duplex interface. 4,314,334, Cl. 364-200.000.

Daughton, John W.: *See*—
Wartinger, Raymond C.; Braswell, Charles D.; Buchalter, Neal S.; Daughton, John W.; and Ellis, Robert G., 4,313,673, Cl. 355-14.00R.

Dauvergne, Hector A. Nuclear power plant with on-site storage capabilities. 4,313,795, Cl. 376-280.000.

Davies, John T.; and Reichelderfer, Richard F., to Branson International Plasma Corporation. Computer controlled system for processing semiconductor wafers. 4,313,783, Cl. 156-643.000.

Davila, Jose E.: *See*—
Gomez, Jim H.; and Davila, Jose E., 4,313,700, Cl. 406-156.000.

Davis, James W., to Mead Corporation, The. Document scanner. 4,314,159, Cl. 250-561.000.

Dayco Corporation: *See*—
Holden, Homer N.; Kleykamp, Donald L.; Moore, William F.; and Mathieu, Julien C., 4,313,384, Cl. 105-225.000.

Declercq, Paul G.: *See*—
Franklin, Timothy W.; and Declercq, Paul G., 4,313,990, Cl. 428-85.000.

Decoursey, Calvin H.; and Townsend, Todd V. Receiver for pulse code multiplexed signals. 4,314,368, Cl. 370-108.000.

Deeds, Larry B. Folding cover for truck bed. 4,313,636, Cl. 296-100.000.

Deere & Company: *See*—
Prasad, Keni K., 4,313,728, Cl. 474-14.000.

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Klenk, Herbert; Wirthwein, Rolf; Siekmann, Gerd; and Schwerdtel, Wulf, 4,313,879, Cl. 260-343.000.

Degussa Aktiengesellschaft: *See*—
Kleemann, Axel; Leuchtenberger, Wolfgang; Martens, Jurgen; and Weigel, Horst, 4,313,894, Cl. 260-465.400.

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Johns, Robert K.; Deist, Donald W.; and Houston, Owen M., 4,314,344, Cl. 364-500.000.

de Lange, Tinus, to Wavin B.V. Pipe part with a displaceable abutment edge. 4,313,627, Cl. 285-114.000.

de Lange, Willem: *See*—
Duinker, Hendrik; and de Lange, Willem, 4,313,941, Cl. 424-225.000.

Delgadillo, Joseph A., to Fortin Laminating Corporation. Circuit board and method for producing same. 4,313,995, Cl. 428-201.000.

Del Principe, Robert M.: *See*—
Bernstein, William L.; and Del Principe, Robert M., 4,314,336, Cl. 364-411.000.

del Toro, James J.: *See*—
Chrostowski, Ronald F.; Bussjager, Rudy C.; and del Toro, James J., 4,313,313, Cl. 62-278.000.

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Dembecki, Stanley L., to Silver Cloud Enterprises, Inc. Apparatus and method for producing edible food fillable cones. 4,313,964, Cl. 426-138.000.

de Mevergnies, Marcel N.; and Fettweis, Paul, to "Studiecentrum voor Kernenergie," "S.C.K.". Method for enriching a gaseous isotopic mixture with at least one isotope. 4,313,807, Cl. 204-157.10R.

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Dennison Manufacturing Company: *See*—
Kingston, Katherine A., 4,313,994, Cl. 428-200.000.
Magnotta, Frank A., 4,313,986, Cl. 428-40.000.

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Segawa, Hiroshi; and Akizuki, Katsufumi, 4,313,753, Cl. 71-61.000.

DePuy, Robert P., to General Electric Company. Transistor drive control for a multiple input D.C. to D.C. converter. 4,314,327, Cl. 363-142.000.

Derouane, Eric G.: *See*—
Sherwood, Rexford D.; Baker, Rees T. K.; Derouane, Eric G.; and Pieters, Wim J. M., 4,313,853, Cl. 252-445.000.

Descamps-Latscha, Beatrice, to Institut National de La Sante et de La Recherche Medicale. Process for determining the complement-dependent cytotoxicity mediated by anti-HLA antibodies by means of ATP determination and device for ATP determination. 4,314,026, Cl. 435-7.000.

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Desmond, John D.: *See*—
Hart, Joseph J.; and Desmond, John D., 4,313,540, Cl. 206-588.000.
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Deutsche Babcock Aktiengesellschaft: *See*—
Ostendorf, Hermann, 4,313,398, Cl. 122-4.00D.

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Beschke, Helmut; Friedrich, Heinz; Muller, Klaus-Peter; and Schreyer, Gerd, 4,314,064, Cl. 546-317.000.

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Handa, Ryoji; Yoshida, Norimasa; Hosoda, Jun; and Furuno, Akihisa, 4,313,863, Cl. 260-29.60E.

DiBlasio, John A., to Brandt-Pra, Inc. Self-compensating stripper assembly for document handling and counting apparatus. 4,313,598, Cl. 271-124.000.

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Kucharzyk, Werner; and Rohde, Wolfgang, 4,313,704, Cl. 414-199.000.

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Schreyer, James M.; and Dorsey, George F., 4,313,424, Cl. 126-433.000.
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Goto, Jugo; and Doura, Fumihiro, 4,314,042, Cl. 525-59.000.
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Burney, Harry S.; and Ezzell, Bobby R., 4,313,805, Cl. 204-98.000.
Johnson, Robert L.; and Gooch, Ralph M., 4,313,977, Cl. 427-342.000.
Massingill, John L., 4,313,886, Cl. 260-348.150.
Myint, U. Hla, 4,313,337, Cl. 73-12.000.
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Shewbart, William E.; Sims, Steve A.; Head, Billy D.; and White, G. Eldon, 4,314,090, Cl. 585-328.000.
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Schwanbom, Erik; and Hickmann, Karl, 4,313,436, Cl. 128-203.120.
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Klein, Erich; and Rojahn, Willi, 4,313,855, Cl. 252-522.00R.
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Castera, Jean P.; Hartemann, Pierre; and Dupont, Jean M., 4,314,214, Cl. 333-141.000.
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Cherier, Jacques; Dupressoir, Albert; and Aubergeon, Olivier, 4,314,246, Cl. 343-6.00R.
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Murdock, Keith C.; Damiani, Martin R.; and Durr, Frederick E., 4,314,061, Cl. 544-80.000.
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Engelhardt, Friedrich; Hintermeier, Karl; Ribka, Joachim; Dursch, Walter; and Rupp, Walter, 4,314,052, Cl. 528-287.000.
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Dwire, Jerold D.: *See—*
Demke, Kent R.; Dwire, Jerold D.; Ko, Michael A.; and Mumola, Joanne L., 4,314,244, Cl. 340-731.000.
Dwyer, Daniel E., Jr., to General Foods Corporation. Process for preparing microporous structured soluble coffee product. 4,313,265, Cl. 34-5.000.
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Steele, James R., 4,313,699, Cl. 406-93.000.
Dynamic Instrument Corporation: *See—*
Marro, Michael; and Monin, John, 4,314,201, Cl. 324-127.000.
Dynamit Nobel AG: *See—*
Barfurth, Dieter; and Nestler, Heinz, 4,313,851, Cl. 252-431.00R.
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Patel, Kishor J., 4,313,468, Cl. 137-625.610.
e.d. Veglia: *See—*
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E. R. Squibb & Sons, Inc.: *See—*
Ondetti, Miguel A.; and Ryono, Denis E., 4,313,948, Cl. 424-273.00R.
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Adin, Anthony; and Fleming, James C., 4,314,019, Cl. 430-202.000.
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O'Brien, David F.; Whitesides, Thomas H.; and Klingbiel, Richard T., 4,314,021, Cl. 430-270.000.
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French, William W.; Lemke, James U.; and McClure, Richard J., 4,314,298, Cl. 360-121.000.
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Kenny, Andrew A., 4,313,561, Cl. 237-12.30A.
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Pearson, John, 4,313,324, Cl. 72-149.000.
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Luscher, Jacob, 4,314,161, Cl. 307-221.00C.
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Eckert, Robert D., to General Fire Extinguisher Corporation. Fire extinguishing system of the type including container and driven probe against a seal for release of material. 4,313,501, Cl. 169-58.000.
Edelson, Jack. Handlebar pack and support for bicycle. 4,313,548, Cl. 224-36.000.
Egosi, Dan. Feedback energy conversion system. 4,313,305, Cl. 60-648.000.
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Gradl, Reinhard; Schrodter, Klaus; and Ehlers, Klaus-Peter, 4,313,826, Cl. 210-114.000.
Ehret, Yale W.; and Kasner, Gerald C., to Adams & Westlake Company, The. Quick opening latch arrangement for hinged vehicle windows. 4,313,280, Cl. 49-141.000.
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Thir, Basil; Newkirk, David D.; Eisenstein, Stephen E.; and Langdon, William K., 4,314,000, Cl. 428-265.000.
Eldridge, Raymond W.; and Winter, David F., to International Telephone and Telegraph Corporation. Cable connector. 4,314,093, Cl. 174-73.00R.
Electric Power Research Institute, Inc.: *See—*
Sisk, Francis J., 4,313,307, Cl. 62-79.000.
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Rusu, John, 4,314,169, Cl. 310-46.000.
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Krasser, Fritz, 4,314,217, Cl. 335-188.000.
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Plasko, Emil R., 4,314,224, Cl. 337-408.000.
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Sandler, Louis M.; Spofford, Walter R.; and Scott, Charles E., 4,314,197, Cl. 323-324.000.
Spurr, Robert, 4,313,720, Cl. 425-526.000.
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and its use as a levelling auxiliary, levelling auxiliaries and processes for uniform dyeing. 4,314,052, Cl. 528-287.000.

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Lee, Alan S., 4,313,711, Cl. 415-7.000.

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Goldberger, William M.; Epstein, Harold M.; and Parekh, Bhupendra K., 4,313,573, Cl. 241-1.000.

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Spiewok, Leonhard, 4,313,992, Cl. 428-136.000.

Eselun, Steven A.: *See*—
Wolff, Ernest G.; and Eselun, Steven A., 4,313,679, Cl. 356-244.000.

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Kaun, Thomas D.; and Eshman, Paul F., 4,313,259, Cl. 29-623.200.

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Nygaard, Sven, 4,313,676, Cl. 355-56.000.

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Fillion, Pierre, 4,314,119, Cl. 200-47.000.

Etchell, Gordon; and Frank, Cyril W., to Pathfinder Graphic Associates, Inc. No-lock printing plate assembly using flexible plates. 4,313,378, Cl. 101-415.100.

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Burke, James E., 4,313,569, Cl. 239-333.000.
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Larson, Louis A.; and Euteneuer, Charles L., 4,313,669, Cl. 354-354.000.

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Everett, Patrick N., to Jersey Nuclear-Avco Isotopes, Inc. Mode-locking and chirping system for lasers. 4,314,210, Cl. 372-18.000.

Ex-Cell-O Corporation: *See*—
Lisiecki, Robert E., 4,313,553, Cl. 229-17.00G.

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Jones, Wallace R.; Haas, John F.; Krieger, Paul A.; and Frappier, David E., 4,313,970, Cl. 427-56.100.

Exley, Vern R., to Joy Manufacturing Company. Emergency brake system employing shuttle valve. 4,313,643, Cl. 303-71.000.

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Petersen, Clifford W.; Bednar, John M.; Hocker, Edwin J., Jr.; Gauger, David H.; and Henderson, James M., 4,314,365, Cl. 367-82.000.

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Aldridge, Clyde L.; and Bearden, Roby, Jr., 4,313,818, Cl. 208-108.000.
Austin, Richard G.; and Michaelson, Robert C., 4,314,088, Cl. 568-860.000.
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Gupta, Ramesh, 4,313,908, Cl. 422-111.000.
Ledford, Thomas H.; and Perez, Raul E., 4,313,922, Cl. 423-578.00R.
Lundberg, Robert D.; Makowski, Henry S.; O'Brien, Dennis; and Klein, Robert R., 4,313,862, Cl. 260-29.6SQ.
Sherwood, Rexford D.; Baker, Rees T. K.; Derouane, Eric G.; and Pieters, Wim J. M., 4,313,853, Cl. 252-445.000.
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Burney, Harry S.; and Ezzell, Bobby R., 4,313,805, Cl. 204-98.000.

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Skatsche, Othmar; Fachbach, Heinz; Thien, Gerhard; Kirchweger, Karl; Greier, Josef; and List, Hans, 4,313,405, Cl. 123-195.00C.

Faerber, Nelson A.: *See*—
Bonner, Edgar L.; and Faerber, Nelson A., 4,314,285, Cl. 360-33.000.

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Fail Safe Industries, Inc.: *See*—
Wise, Stanley S.; and Csurgay, Gregory, 4,313,641, Cl. 303-3.000.

Fairchild, Arthur: *See*—
La Plante, Donald W.; Fairchild, Arthur; and Rebucci, Eugene L., 4,314,241, Cl. 340-603.000.

Farber, Heinrich: *See*—
Bauer, Walter; and Farber, Heinrich, 4,313,538, Cl. 206-455.000.

Farha, Floyd E., Jr.; and Gardner, Lloyd E., to Phillips Petroleum Co. Hydrodesulfurization of organic sulfur compounds and hydrogen sulfide removal with incompletely sulfided zinc titanate materials. 4,313,820, Cl. 208-213.000.

Farr, Glyn P. R., to Girling Limited. Hydraulic power boosters for vehicle braking systems. 4,313,302, Cl. 60-547.00R.

Farr, Glyn P. R., to Lucas Industries Limited. Disc brake caliper having a sliding cylinder. 4,313,526, Cl. 188-72.400.

Faulkner, Alfred H. Harmonic generator for additive synthesis of musical tones. 4,313,360, Cl. 84-1.210.

Faulkner, James D., to Lester Laboratories, Inc. Increasing the rate of neutralization of static electricity. 4,314,308, Cl. 361-212.000.

Faure, Alphonse W.: *See*—
Lulejian, Donald A.; Faure, Alphonse W.; and Fijalkowski, Eugene F., 4,313,750, Cl. 65-160.000.

Fauth, Frederick E., to American Bottlers Equipment Co., Inc. Conveyor and control therefor. 4,313,536, Cl. 198-781.000.

Fehlmann, Viktor, to Ferrum AG. Apparatus for pitting dates or the like. 4,313,373, Cl. 99-549.000.

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Wischniewski, Martin; Feicho, Lutz; and Althaus, Werner, 4,313,930, Cl. 424-32.000.

Feier, Markus; Frey, Raymond; and Marti, Ulrich, to Contraves AG. Auxiliary apparatus for a particle analyser. 4,314,346, Cl. 364-555.000.

Feight, Robert A., to Rockwell International Corporation. Cam-lock rocket securing mechanism. 4,313,567, Cl. 239-265.330.

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Feldman, Charles; Charles, Harry K.; and Satkiewicz, Frank G., to Johns Hopkins University, The. Thin-film silicon solar cell with metal boride bottom electrode. 4,313,254, Cl. 29-572.000.

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Fesenko, Evgeny G.; Dantsiger, Alla Y.; Filipiev, Viktor S.; Razumovskaya, Olga N.; Klevtsov, Alexandr N.; Lebedev, Vladimir N.; Grineva, Ljudmila D.; Rogach, Tatyana V.; Feronov, Anatoly D.; Akbaeva, Galina M.; Cheptsov, Evgeny I.; Panich, Anatoly E.; Lisitsina, Ljudmila G.; Lavrikova, Svetlana A.; Ochirov, Vasily A.; Dudkina, Svetlana I.; Nevsky, Alexandr N.; Aleshin, Vladimir A.; Kupriyanov, Mikhail F.; Baljunis, Evgeny S.; Mordanov, Boris P.; Zhitomirsky, Grigory A.; Feldman, Naum B.; Smazhevskaya, Ekaterina G.; and Devlikanova, Ravilya U., 4,313,839, Cl. 252-62.900.

Fenk, Josef, to Siemens Aktiengesellschaft. Monolithically integrable semiconductor circuit with an amplifier controlled by a photo diode. 4,314,152, Cl. 250-214.00A.

Feronov, Anatoly D.: *See*—
Fesenko, Evgeny G.; Dantsiger, Alla Y.; Filipiev, Viktor S.; Razumovskaya, Olga N.; Klevtsov, Alexandr N.; Lebedev, Vladimir N.; Grineva, Ljudmila D.; Rogach, Tatyana V.; Feronov, Anatoly D.; Akbaeva, Galina M.; Cheptsov, Evgeny I.; Panich, Anatoly E.; Lisitsina, Ljudmila G.; Lavrikova, Svetlana A.; Ochirov, Vasily A.; Dudkina, Svetlana I.; Nevsky, Alexandr N.; Aleshin, Vladimir A.; Kupriyanov, Mikhail F.; Baljunis, Evgeny S.; Mordanov, Boris P.; Zhitomirsky, Grigory A.; Feldman, Naum B.; Smazhevskaya, Ekaterina G.; and Devlikanova, Ravilya U., 4,313,839, Cl. 252-62.900.

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Fehlmann, Viktor, 4,313,373, Cl. 99-549.000.

Fesenko, Evgeny G.; Dantsiger, Alla Y.; Filipiev, Viktor S.; Razumovskaya, Olga N.; Klevtsov, Alexandr N.; Lebedev, Vladimir N.; Grineva, Ljudmila D.; Rogach, Tatyana V.; Feronov, Anatoly D.; Akbaeva, Galina M.; Cheptsov, Evgeny I.; Panich, Anatoly E.; Lisitsina, Ljudmila G.; Lavrikova, Svetlana A.; Ochirov, Vasily A.; Dudkina, Svetlana I.; Nevsky, Alexandr N.; Aleshin, Vladimir A.; Kupriyanov, Mikhail F.; Baljunis, Evgeny S.; Mordanov, Boris P.; Zhitomirsky, Grigory A.; Feldman, Naum B.; Smazhevskaya, Ekaterina G.; and Devlikanova, Ravilya U. Piezoceramic material. 4,313,839, Cl. 252-62.900.

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de Mevergnies, Marcel N.; and Fettweis, Paul, 4,313,807, Cl. 204-157.10R.

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Filisetti, Attilio: *See*—
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Filtrol Corporation: *See*—
Block, Thomas E.; and Scherzer, Julius, 4,313,923, Cl. 423-628.000.

Finnemore, Fred M., to Polaroid Corporation. Carrying strap attachment for camera. 4,313,664, Cl. 354-288.000.

Fisch, Richard S., to Minnesota Mining and Manufacturing Company. Photoresist developers and process. 4,314,022, Cl. 430-326.000.

Fischbeck, Kenneth H.; Wright, Allen T.; Bain, Lee L.; and Paraskevopoulos, Demetris E., to Xerox Corporation. Multifunction graphic engine based on an oscillating scanner. 4,314,282, Cl. 358-286.000.

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Ratigan, Brian J.; and Roop, Robert N., 4,313,827, Cl. 210-136.000.
Fischer, Robert L., to Caterpillar Tractor Co. Tandem ripper assembly. 4,313,504, Cl. 172-382.000.
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Fishwick, Brian R.: *See*—
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Fitzgerald, Patrick W. Folding furniture. 4,313,385, Cl. 108-38.000.
Fleckenstein, Andrew J.; and Mortl, Michael C., to L. W. Fleckenstein, Inc. Control system for meter actuated regeneration in a water treatment system. 4,313,825, Cl. 210-89.000.
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Fleming, Mills L.; and Mullin, Francis J., to Bell Telephone Laboratories, Incorporated; and Western Electric Company, Inc. Methods of and apparatus for rehabilitating outside telephone plant. 4,314,092, Cl. 174-38.000.
Fleming, Robert J. Toy chair construction kit. 4,313,276, Cl. 46-16.000.
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King, Patrick D., 4,313,596, Cl. 266-207.000.
Florent, Jean; Lunel, Jean; Mancy, Denise; and Vuillemin, Bernard, to Rhone-Poulenc Industries. Biologically active substance, its preparation and compositions containing it. 4,313,936, Cl. 424-117.000.
Flow Industries, Inc.: *See*—
Olsen, John H., 4,313,570, Cl. 239-583.000.
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FMC Corporation: *See*—
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Skoli, Sigmund P.; Ore, William C.; Kemp, David M.; and Mojonnier, Harry G., 4,313,370, Cl. 99-323.100.
Focant, Jean, to Stephan Pasek & Cie, Societe Anonyme; and Cockerill, Societe Anonyme, a part interest. Apparatus for the projection of refractory and other material particularly for the repair of the linings of metallurgical plant. 4,313,565, Cl. 239-132.300.
Foffel, John F., to Berlin Industries, Inc. Envelope insert for magazines. 4,313,557, Cl. 229-68.00R.
Fohl, Artur, to Repa Feinstanzwerk GmbH. Belt buckle or lock for a safety belt. 4,313,246, Cl. 24-230.0AT.
Foley, John T.: *See*—
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Follows, James S.; and Grant, Douglas. Rain gutter joint. 4,313,693, Cl. 405-121.000.
Folmer, Carroll W.; and Hunter, Aldridge T., to Rohr Industries, Inc. Reverser door mechanisms. 4,313,581, Cl. 244-110.00B.
Ford, Jere B., Jr., to Jere B. Ford, Inc. Roadway striper. 4,313,780, Cl. 156-523.000.
Ford, Michael E.; and Johnson, Thomas A., to Air Products and Chemicals, Inc. Preparation of linear polyalkylene polyamines. 4,314,083, Cl. 564-479.000.
Ford Motor Company: *See*—
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Forsyth, Paul F.: *See*—
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Delgadillo, Joseph A., 4,313,995, Cl. 428-201.000.
Fortuna, Jon A.: *See*—
Donmoyer, William L.; and Fortuna, Jon A., 4,314,312, Cl. 361-400.000.
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Fought, Harold D., to Docutel Corporation. Banking machine. 4,314,352, Cl. 364-900.000.
Fowler, Clarence W.; and Penrod, Bruce M., to Tractor, Inc. Antenna low-noise Q spoiling circuit. 4,314,378, Cl. 455-291.000.
Fowlkes, Robert L.: *See*—
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Fox, Brian G.: *See*—
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Frahme, Carl E., to Industrial Insulations Inc. Lightweight refractory fiber burner block. 4,313,789, Cl. 162-152.000.
Frandsen, Jorgen, to Burroughs Corporation. Linear actuator with staggered flat coils. 4,314,295, Cl. 360-106.000.
Frank, Cyril W.: *See*—
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Frank, Frank, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Endoscopic apparatus with a laser light conductor. 4,313,431, Cl. 128-7.000.
Frank, Helen: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Paaren, Herbert E.; and Frank, Helen, 4,313,942, Cl. 424-236.000.
Franklin, Timothy W.; and Declercq, Paul G., to Schlegel (UK) Limited. Pile weatherstrip. 4,313,990, Cl. 428-85.000.
Frappier, David E.: *See*—
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Frawley, William: *See*—
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Freeman, Ian B.; Rooney, John O.; and Hardwick, John F., to Burroughs Corporation. High storage density disc file. 4,314,287, Cl. 360-51.000.
Frelin, Frank J.; Kelly, Timm L.; and Malloy, Anthony J., to Amchem Products, Inc. Coating solution for metal surfaces. 4,313,769, Cl. 148-6.270.
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French, William W.; Lemke, James U.; and McClure, Richard J., to Eastman Technology, Inc. Multitrack magnetic head employing double helix structure. 4,314,298, Cl. 360-121.000.
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Feier, Markus; Frey, Raymond; and Marti, Ulrich, 4,314,346, Cl. 364-555.000.
Fridlender, Bertold R., to Ames-Yissum Ltd. Immunoassay method for detecting viral antibodies in whole blood samples. 4,313,927, Cl. 424-1.000.
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Humphries, John M.; Baxter, Ivor R.; and Fripp, David G. F., 4,314,153, Cl. 250-231.0SE.
Fritschi, Hermann. Stretching and folding appliance. 4,313,268, Cl. 38-12.000.
Front, Charles M. Wind deflector system for aerodynamic drag reduction. 4,313,635, Cl. 296-1.00S.
Frye, Robert B.; and Conroy, James T., to General Electric Company. Method for improving adhesion of silicone resin coating composition. 4,313,979, Cl. 427-387.000.
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Fryer, George R., 4,314,131, Cl. 219-58.000.
Fryer, George R., to Fryer Corporation. Method of band welding with weld testing. 4,314,131, Cl. 219-58.000.
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Idemoto, Noboru; Yamada, Minoru; Tashiro, Mamoru; and Matsushita, Sachio, 4,313,808, Cl. 204-180.00P.
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Fujikake, Jun, to Fukurawa Metals Co., Ltd. Method of producing heat transfer tube for use in boiling type heat exchangers. 4,313,248, Cl. 29-157.30A.
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Komori, Tadaaki; Yamashita, Michio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,313,935, Cl. 424-115.000.
Fujitsu Limited: *See*—
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Fukunaga, Yukio, to Nissan Motor Company, Limited. Structure for mounting a meter on an instrument panel of motor vehicles. 4,313,584, Cl. 248-27.300.
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Fulmer, Glenn E.; and Vollmerhausen, Conrad, to W. R. Grace & Co. Polyurea polyurethane foamed sponge with high wet strength. 4,314,034, Cl. 521-65.000.
Furukawa, Yoshimi; and Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Steering apparatus for vehicles. 4,313,514, Cl. 180-143.000.
Furuno, Akihisa: *See*—
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Furuya, Michio; and Sakamoto, Susumu, to Tokyo Automatic Machinery Works, Ltd. Apparatus for packing. 4,313,290, Cl. 53-230.000.
Fusion Systems Corporation: *See*—
Matthews, John C.; and Couch, Robert W., 4,313,969, Cl. 427-44.000.
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Vilen, Erik O., 4,313,451, Cl. 134-47.000.
Gaber, Martin, to Illinois Tool Works Inc. Switch with sliding contactor. 4,314,121, Cl. 200-67.00G.
GAF Corporation: *See*—
Tracy, David J.; Wood, Lindley S.; and Chakrabarti, Paritosh M., 4,313,764, Cl. 106-188.000.
Gaines, Thomas M., to Industrial Nuclear Company, Inc. Safety lock for radiography exposure device. 4,314,157, Cl. 250-497.000.
Galia, Karl. Method and apparatus for selecting and dispensing individual recording discs stored in compartments in a juke-box. 4,314,366, Cl. 369-35.000.
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Gammill, Ronald B., to Upjohn Company, The. 5-Hydroxyfurochromones. 4,313,881, Cl. 260-345.200.
Gammill, Ronald B., to Upjohn Company, The. 7-Methyl-6-methylthio-, methylsulfinyl-, and methylsulfonyl-methyl-furochromones. 4,313,882, Cl. 260-345.200.
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Gotovtseva, Ljubov A.; Konkova, Maia B.; Garbuz, Tatyana F.; Bunin, Oleg A.; Osminin, Evgeny A.; Zabavina, Nina A.; Ivanov, Alexei I.; Snopov, Vladimir P.; and Batkov, Aiexandr I., 4,313,235, Cl. 8-149.100.
Gardner, Hugh C., to Union Carbide Corporation. Composition containing a half ester of an organic polyol, an unsaturated monomer, an epoxide, and a basic compound. 4,313,859, Cl. 260-18.0PF.
Gardner, Lloyd E.: *See*—
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Garrard, Bruce. Gas and liquid admixing system. 4,313,897, Cl. 261-64.00D.
Garwood, William E.; Voltz, Sterling E.; and Wu, Ellen L., to Mobil Oil Corporation. Processing of coal liquefaction products. 4,313,821, Cl. 208-245.000.
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Gavin, Derek G.; and Jones, Michael A., to Coal Industry (Patents) Limited. Catalysts. 4,313,852, Cl. 252-439.000.
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Gaylor, V. Frances; Greene, Janice L.; Miller, Arthur F.; and Pichler, Marty A., to Standard Oil Company, The. Electrochemical maintenance of optimum catalytic activity in copper-catalyzed nitrile hydrolysis processes. 4,313,803, Cl. 204-74.000.
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Schmidt, Eberhard, 4,314,310, Cl. 361-331.000.
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Barnes, Norman S.; and Mogle, Rodman A., 4,313,262, Cl. 29-840.000.
Blake, Charles R., 4,314,008, Cl. 429-8.000.
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Frye, Robert B.; and Conroy, James T., 4,313,979, Cl. 427-387.000.
Haaf, William R.; and Lee, Gim F., Jr., 4,313,864, Cl. 260-30.60R.
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Hughes, Raymond B., 4,313,999, Cl. 428-251.000.
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Kindig, Alan L.; and Wesseldyk, Albert J., 4,313,258, Cl. 29-596.000.
Tomlinson, Harold W., Jr., 4,313,510, Cl. 177-165.000.
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George Koch Sons, Inc.: *See*—
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Gernert, Herbert, to Agfa-Gevaert Aktiengesellschaft. Stabilized photographic emulsion, a process for its preparation and stabilized photographic materials. 4,314,024, Cl. 430-564.000.
Gerow, Gordon P.; and Blake, John H., to FMC Corporation. Citrus processing system and method. 4,313,372, Cl. 99-483.000.
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Glenn, William E., to New York Institute of Technology. Method and apparatus for ultrasonic Doppler detection. 4,313,444, Cl. 128-663.000.
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Godfrey, Frederick D., Jr., to Gulf & Western Corporation. Apparatus and method of producing a succession of die cut tobacco blanks. 4,313,435, Cl. 128-105.000.
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Gille, Gunther; Goertler, Horst; Prohaska, Hans; and Rachner, Horst, 4,314,186, Cl. 318-434.000.
Gold, Nicholas, to Polaroid Corporation. Film processor having automatically actuated film severing means. 4,313,667, Cl. 354-303.000.
Goldberger, William M.; Epstein, Harold M.; and Parekh, Bhupendra K., to Battelle Development Corporation. Two stage comminution. 4,313,573, Cl. 241-1.000.
Goldenberg, Enrique A. Diverter/bypass valve. 4,313,428, Cl. 126-422.000.
Goller, Glen J.; and Salonia, Joseph R., to United Technologies Corporation. Dry method for making an electrochemical cell electrode. 4,313,972, Cl. 427-113.000.
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Gomez, Jim H.; and Davila, Jose E., to Transit Systems Technology, Inc. Fare collection system and components thereof. 4,313,700, Cl. 406-156.000.
Gomez, Michel, to e.d. Veglia. Daily mileage recording unit. 4,314,149, Cl. 235-96.000.
Gonzales, Frank, Jr.; and Sobon, Joseph, to International Business Machines Corp. Method of forming a ceramic article with a glassy surface. 4,313,900, Cl. 264-61.000.
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Gorchev, Dimiter; and Ingard, Karl U., to Mitco Corporation. Static pressure regain coupler for an air distribution system. 4,313,522, Cl. 181-224.000.
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Gradl, David A., to Q-Dot, Inc. Transient data recorder systems. 4,314,212, Cl. 333-20.000.
Gradl, Reinhard; Schrodter, Klaus; and Ehlers, Klaus-Peter, to Hoechst Aktiengesellschaft. Liquid-liquid extraction apparatus. 4,313,826, Cl. 210-114.000.
Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; and Leontas, Spiro, to Diebold Incorporated. Automatic banking machine with sealed tamper-indicating container for receiving and storing diverted paper money bills. 4,313,601, Cl. 271-207.000.
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Grammatica, Steven J., to Xerox Corporation. Photoconductive reflex exposure member. 4,314,012, Cl. 430-31.000.
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Grant, Douglas: *See*—
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Gras, Rainer; and Wolf, Elmar, to Chemische Werke Huls Aktiengesellschaft. Production of isophoronediisocyanate adducts containing free NCO-grops and NCO-groups end blocked with ϵ-caprolactam. 4,313,876, Cl. 260-239.30R.
Graves, Richard E., Jr.: *See*—
Throne, James L.; and Graves, Richard E., Jr., 4,314,036, Cl. 521-99.000.
Graves, Walter E., Jr.; Boys, Donald; and Turner, Frederick T., to Varian Associates, Inc. Sputter-coating system, and vaccuum valve, transport, and sputter source array arrangements therefor. 4,313,815, Cl. 204-298.000.
Greatbatch, Wilson. Tissue growth control apparatus and method. 4,313,438, Cl. 128-207.210.
Green Cross Corporation, The: *See*—
Arimura, Hirofumi; Nagai, Masanori; Yamauchi, Takeshi; Kitagawa, Tsutomu; and Suyama, Tadakazu, 4,313,938, Cl. 424-180.000.
Greenbaum, George. Agricultural system with articulated members. 4,313,279, Cl. 47-29.000.
Greene, Janice L.: *See*—
Gaylor, V. Frances; Greene, Janice L.; Miller, Arthur F.; and Pichler, Marty A., 4,313,803, Cl. 204-74.000.
Greenspan, Joseph, to Beatrice Foods Co. Method for tenderizing cut meat portions. 4,313,963, Cl. 426-58.000.
Grefco, Inc.: *See*—
Ruff, David L.; and Nath, Narikottile G., 4,313,997, Cl. 428-220.000.
Grehal, Pierre: *See*—
Malagnoux, Roger; and Grehal, Pierre, 4,313,333, Cl. 72-410.000.
Greier, Josef: *See*—
Skatsche, Othmar; Fachbach, Heinz; Thien, Gerhard; Kirchweger, Karl; Greier, Josef; and List, Hans, 4,313,405, Cl. 123-195.00C.
Greve, Heinz; and Whale, Gunter, to Hauni-Werke Korber & Co. KG. Method of applying atomized liquid plasticizer to a running tow of filamentary filter material. 4,313,974, Cl. 427-209.000.
Griffith, Charles E. Fused short circuit and grounding switch. 4,314,300, Cl. 361-13.000.
Grim, George B.: *See*—
Belke, William H.; Goloff, Alexander; and Grim, George B., 4,313,301, Cl. 60-39.51H.
Grineva, Ljudmila D.: *See*—
Fesenko, Evgeny G.; Dantsiger, Alla Y.; Filipiev, Viktor S.; Razumovskaya, Olga N.; Klevtsov, Alexandr N.; Lebedev, Vladimir N.; Grineva, Ljudmila D.; Rogach, Tatyana V.; Feronov, Anatoly D.; Akbaeva, Galina M.; Cheptsov, Evgeny I.; Panich, Anatoly E.; Lisitsina, Ljudmila G.; Lavrikova, Svetlana A.; Ochirov, Vasily A.; Dudkina, Svetlana I.; Nevsky, Alexandr N.; Aleshin, Vladimir A.; Kupriyanov, Mikhail F.; Baljunis, Evgeny S.; Mordanov, Boris P.; Zhitomirsky, Grigory A.; Feldman, Naum B.; Smazhevskaya, Ekaterina G.; and Devlikanova, Ravilya U., 4,313,839, Cl. 252-62.900.
Grootcon (U.K.) Limited: *See*—
Porter, Ronald, 4,314,132, Cl. 219-61.000.
Grove Valve and Regulator Company: *See*—
Adamson, Kenneth S., 4,313,462, Cl. 137-512.100.
Brumm, Richard S., 4,313,461, Cl. 137-489.000.
Groves, Peter H.; and Hilbourne, Robert A., to U.S. Philips Corporation. Voltage clamping circuit. 4,314,167, Cl. 307-540.000.
Gruppo Lepetit S.p.A.: *See*—
Guzzi, Umberto; Omodei-Sale, Amedeo; and Galliani, Giulio, 4,313,950, Cl. 424-258.000.
Grzesnikowski, Walter. Universal equipment leg. 4,313,586, Cl. 248-188.400.
Gschwend, Heinz W.: *See*—
Huebner, Charles F.; and Gschwend, Heinz W., 4,313,955, Cl. 424-278.000.
GTE Automatic Electric Labs Inc.: *See*—
Tin, Kam B.; and Norman, Stanley R. C., 4,314,164, Cl. 307-243.000.
Guenther, Robert O.; and Huffhines, Donald F., to Mobil Oil Corporation. System for deploying and retrieving seismic source assembly from marine vessel. 4,313,392, Cl. 114-244.000.
Gulf Oil Corporation: *See*—
Bertino, Clarence D.; Hill, Robert W.; and Schulz, J. Gustav, 4,313,887, Cl. 260-367.000.
Gulf Research & Development Company: *See*—
Tsai, Shirley C.; Graham, Richard H.; and Oder, Robin R., 4,313,499, Cl. 166-248.000.
Gulf & Western Corporation: *See*—
Godfrey, Frederick D., Jr., 4,313,435, Cl. 128-105.000.
Gulley, Mark R., to Air Products and Chemicals, Inc. Process for reducing oxygen consumption in black liquor oxidation. 4,313,788, Cl. 162-31.000.
Gunkinger, Siegfried; Weeger, Hans-Peter; Kriechbaum, Kurt; and Igel, Wolfgang, to Zinser Textilmaschinen Gesellschaft mit beschrankter Haftung. Methods and apparatus for changing bobbins in flyer spinning frames. 4,313,299, Cl. 57-267.000.
Gunter, Thomas G.; Musa, Fuad H.; Wilder, Wm. B., Jr.; and Wiles, Michael F., to Motorola Inc. On chip ram interconnect to MPU bus. 4,314,353, Cl. 364-900.000.
Gupta, Ramesh, to Exxon Research & Engineering Co. Catalytic reactor having bed bypass. 4,313,908, Cl. 422-111.000.
Guthrie, Robert W.: *See*—
Fahrenholtz, Kenneth E.; Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., 4,314,085, Cl. 568-644.000.
Gutsche, Walter: *See*—
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Guzzi, Umberto; Omodei-Sale, Amedeo; and Galliani, Giulio, to Gruppo Lepetit S.p.A. Antireproductive tricyclic ortho-fused nitrogen containing compounds. 4,313,950, Cl. 424-258.000.
Gyi, Maung, to Ampex Corporation. Amplitude and phase equalizer. 4,314,288, Cl. 360-65.000.
Gyromat Corporation, The: *See*—
Wiggins, Richard F., 4,313,475, Cl. 141-18.000.
H. E. Rudge and Company Limited: *See*—
Adams, John F., 4,313,466, Cl. 137-614.170.
Haaf, William R.; and Lee, Gim F., Jr., to General Electric Company. Polyphenylene oxide/plasticizer/hydrogenated radial teleblock copolymer blends. 4,313,864, Cl. 260-30.60R.
Haas, John F.: *See*—
Jones, Wallace R.; Haas, John F.; Krieger, Paul A.; and Frappier, David E., 4,313,970, Cl. 427-56.100.
Haase, Thomas A.: *See*—
Pesa, Frederick A.; and Haase, Thomas A., 4,313,893, Cl. 260-465.400.
Habal, Mutaz B.; and Leake, Donald L. An elastomeric mesh hinge primarily for replacement of the finger joints. 4,313,232, Cl. 3-1.910.
Haberlein, Peter, to Institut Dr. Friedrich Forster Prufgeratebau. Test arrangement for the non-destructive testing of metallic test pieces. 4,314,203, Cl. 324-262.000.
Habich, Hans-Joachim, to C. A. Greiner & Sohne GmbH. Test tube for the examination of urine samples. 4,314,030, Cl. 435-296.000.
Hafele, Robert X. Blow molding method. 4,313,905, Cl. 264-532.000.

Haga, Hachiro: *See*—
Tsuruta, Mitsuo; and Haga, Hachiro, 4,313,369, Cl. 98-115.0SB.
Hagemann, Edmund; and Wildschutte, Herbert, to Volkswagenwerk AG. Window crank assembly. 4,313,282, Cl. 49-352.000.
Hagin, Faust, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Multiple-power gear drive transmission and drive assembly including such transmission, and brake energy accumulator. 4,313,351, Cl. 74-687.000.
Hahn, Steven R.: *See*—
Bok, Dennis E.; Brown, Mark E.; Hahn, Steven R.; Huliba, David A.; and Wysinski, Thomas M., 4,314,264, Cl. 346-140.00R.
Hailer, Gottfried, to Daimler-Benz Aktiengesellschaft. Independent wheel suspension. 4,313,619, Cl. 280-691.000.
Hain, Paul, to Champion International Corporation. Process for forming laminated paperboard containers. 4,313,899, Cl. 264-40.100.
Hajime Industries, Ltd.: *See*—
Yoshida, Hajime, 4,314,279, Cl. 358-212.000.
Haley, Floyd C., to International Refining Equipment. Climbing film heat exchange apparatus. 4,313,784, Cl. 159-6.00W.
Hall, Eric R. D., to Schaefer Marine, Inc. Mast shroud system. 4,313,391, Cl. 114-90.000.
Halliburton Company: *See*—
Harris, Lawrence E., 4,313,834, Cl. 252-8.55C.
Halliburton Services: *See*—
Brandell, John T., 4,313,495, Cl. 166-53.000.
Halm Instrument Co., Inc.: *See*—
Lyon, Floyd A.; Yale, William H.; and Lyon, Donald, 4,313,419, Cl. 126-421.000.
Ham, Young S. Baseball game apparatus. 4,313,606, Cl. 273-89.000.
Hamaoka, Hiromi: *See*—
Oda, Yasutaka; and Hamaoka, Hiromi, 4,314,291, Cl. 360-78.000.
Hamon, Jean-Pierre: *See*—
de Sivry, Bruno J. M.; Carsac, Claude R.; and Hamon, Jean-Pierre, 4,314,135, Cl. 29-121.0EU.
Handa, Ryoji; Yoshida, Norimasa; Hosoda, Jun; and Furuno, Akihisa, to Nitto Chemical Industry Co. Ltd.; Mitsubishi Rayon Co., Ltd.; and Diafloc Co., Ltd. Modification of acrylamide polymers. 4,313,863, Cl. 260-29.60E.
Hanell, Sigmund H.; and Kreutel, Randall W., Jr., to Communications Satellite Corporation. Intermodulation product suppression by antenna processing. 4,314,250, Cl. 343-100.0SA.
Hansen, Loren F.; and Stolley, Ronald M., to Outboard Marine Corporation. Blade housing mount for riding mowers. 4,313,295, Cl. 56-15.800.
Hanson, Robert B., to Standard Oil Company (Indiana). Glass filled polyamide-imide phthalamide copolymer. 4,313,868, Cl. 260-37.00N.
Hanyu, Susumu; Morimoto, Shyuzo; and Sano, Yasuro, to Janome Sewing Machine Co. Ltd. Sewing machine with a pattern selecting device. 4,313,389, Cl. 112-158.00A.
Hanyu, Yoshiaki: *See*—
Suzuki, Yoshihisa; Kaizuka, Takanoli; Hanyu, Yoshiaki; Otake, Mituyoshi; and Hidano, Yoichi, 4,313,989, Cl. 428-64.000.
Haraguchi, Tosimichi, to Hitachi Metals, Ltd. Permanent magnet type lifting device. 4,314,219, Cl. 335-295.000.
Haraguchi, Youichiro: *See*—
Urai, Muneharu; Abe, Tadafumi; Haraguchi, Youichiro; and Hayashi, Koji, 4,313,776, Cl. 156-220.000.
Harbeke, Gerold J. Pipe support coupling and method of using same. 4,313,286, Cl. 52-220.000.
Harbin, Charles M., to AMCS Corporation. Shoe cleaning machine. 4,313,238, Cl. 15-37.000.
Hardwick, John F., to Burroughs Corporation. Tribit servo track detector. 4,314,286, Cl. 360-40.000.
Hardwick, John F.: *See*—
Freeman, Ian B.; Rooney, John O.; and Hardwick, John F., 4,314,287, Cl. 360-51.000.
Harris Corporation: *See*—
Sanders, Thomas J.; and White, William H., 4,313,768, Cl. 148-1.500.
Sellers, Robert W., 4,314,373, Cl. 455-73.000.
Harris, Lawrence E., to Halliburton Company. High viscosity acidic treating fluids and methods of forming and using the same. 4,313,834, Cl. 252-8.55C.
Harris, Richard W.; and Cleveland, John F., to VBC, Inc. Narrow band voice modulator system. 4,314,104, Cl. 179-15.55R.
Harris & Thrush Manufacturing Company: *See*—
Johnson, Don R., 4,313,631, Cl. 292-201.000.
Hart, Joseph J.; and Desmond, John D., to Container Corporation of America. Carton with article retaining structure. 4,313,540, Cl. 206-588.000.
Hart, Joseph J.; and Desmond, John D., to Container Corporation of America. Carton with article retaining structure. 4,313,541, Cl. 206-588.000.
Hartemann, Pierre: *See*—
Castera, Jean P.; Hartemann, Pierre; and Dupont, Jean M., 4,314,214, Cl. 333-141.000.
Harvey, James P.: *See*—
Richards, Thomas E.; Harvey, James P.; and Daigle, Michael A., 4,313,919, Cl. 423-321.00R.
Hasegawa, Koki: *See*—
Okado, Chihiro; Morishita, Takashi; and Hasegawa, Koki, 4,314,189, Cl. 318-732.000.
Hashimoto, Mitsuru; Sakai, Kiyoshi; Ohta, Masafumi; Kozima, Akio; Sasaki, Masaomi; and Tsutsui, Kyoji, to Ricoh Co., Ltd. Electrophotographic sensitive materials containing disazo compounds. 4,314,015, Cl. 430-58.000.
Hashimoto, Mitsuru: *See*—
Ohta, Masafumi; Hashimoto, Mitsuru; and Tsutsui, Kyoji, 4,314,016, Cl. 430-59.000.
Hashio, Moriki; and Kimura, Tomohiko, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha. Apparatus for changing the width of a cast piece. 4,313,487, Cl. 164-436.000.
Hasquenoph, Jean H.; and Coutin, Pierre F., to R. Alkan & Cie. Device with independent hooks and automatic locking mechanism for hooking up loads under aircraft. 4,313,582, Cl. 244-137.00R.
Hata, Masayuki: *See*—
Kobayashi, Isao; Akimoto, Hideo; Takahashi, Yoshiyuki; Hibiya, Tokio; and Hata, Masayuki, 4,313,343, Cl. 73-290.00V.
Hatch, Burton D., to General Electric Company. Narrow gap collector with integral electromagnetic pump. 4,314,171, Cl. 310-219.000.
Hattori, Tadashi: *See*—
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,313,341, Cl. 73-862.330.
Haug, W. Gordon: *See*—
Tolliver, Daniel R.; and Haug, W. Gordon, 4,313,381, Cl. 102-413.000.
Hauni-Werke Korber & Co. KG.: *See*—
Greve, Heinz; and Whale, Gunter, 4,313,974, Cl. 427-209.000.
Peters, Hartmut, 4,313,577, Cl. 242-66.000.
Haus, Paul Z., Jr.; and Signorelli, John A. Lock and key combination with mastering concept. 4,313,319, Cl. 70-34.000.
Hawkins, Paul F., to Wysong & Miles Company. Workpiece support and discharge system for power squaring shears. 4,313,357, Cl. 83-81.000.
Hayakawa, Shigeru: *See*—
Abe, Atsushi; Ogawa, Hisahito; Nishikawa, Masahiro; Sekido, Satoshi; and Hayakawa, Shigeru, 4,313,338, Cl. 73-23.000.
Matsuoka, Tomizo; Nitta, Tsuneharu; and Hayakawa, Shigeru, 4,314,177, Cl. 313-497.000.
Matsuoka, Tomizo; Nitta, Tsuneharu; and Hayakawa, Shigeru, 4,314,178, Cl. 313-497.000.
Hayami, Masaaki; and Torikoshi, Seiko, to Matsushita Electric Industrial Co., Ltd. Indolins styryl-like compounds. 4,314,058, Cl. 542-455.000.
Hayashi, Koji: *See*—
Urai, Muneharu; Abe, Tadafumi; Haraguchi, Youichiro; and Hayashi, Koji, 4,313,776, Cl. 156-220.000.
Hayashi, Masaharu: *See*—
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Hayashi, Masaki: *See*—
Wakatsuka, Hirohisa; Hayashi, Masaki; and Konishi, Yoshitaka, 4,313,954, Cl. 424-274.000.
Haynes, Munro K., to International Business Machines Corporation. Biased pulsed recording systems and methods. 4,314,289, Cl. 360-77.000.
Hays, Gordon W. Weight portioning method and apparatus. 4,313,507, Cl. 177-1.000.
Hayward Tyler Limited: *See*—
Anderson, Eric J., 4,313,498, Cl. 166-206.000.
Hazue, Masaaki: *See*—
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Head, Billy D.: *See*—
Shewbart, William E.; Sims, Steve A.; Head, Billy D.; and White, G. Eldon, 4,314,090, Cl. 585-328.000.
Head, Claude D., III: *See*—
McNeir, Ridge W.; and Head, Claude D., III, 4,314,342, Cl. 364-468.000.
Hebert, Joel J.: *See*—
Thigpen, Ben B.; and Hebert, Joel J., 4,314,363, Cl. 367-16.000.
Heeren, Hermann; and Kraetschmer, Liselotte, to Maschinenfabrik Augsburg Nurnberg Aktiengesellschaft. Heat exchanger. 4,313,490, Cl. 165-82.000.
Heeres, Jan; and Mostmans, Joseph H., to Janssen Pharmaceutica, N.V. Heterocyclic derivatives of (4-aryloxymethyl-1,3-dioxolan-2-yl)methyl-1H-imidazoles and 1H-1,2,4-triazoles. 4,313,953, Cl. 424-269.000.
Heilman, Marlin S.: *See*—
Moore, Eric R.; Heilman, Marlin S.; and Kinney, Philip C., 4,314,095, Cl. 174-84.00C.
Heinrich, Ernst; and Ribka, Joachim, to Cassella Aktiengesellschaft. Azo coupling in two-phase water-alcohol mixtures. 4,313,872, Cl. 260-152.000.
Heinze, Frank D., Jr.; and Heinze, Frank D., III. Sulky having adjustable fulcrum point. 4,313,611, Cl. 280-63.000.
Heinze, Frank D., III: *See*—
Heinze, Frank D., Jr.; and Heinze, Frank D., III, 4,313,611, Cl. 280-63.000.
Heitman, Christopher J.; and Becker, Joseph A., to General Electric Company. Sealed electrical control device for x-ray apparatus. 4,313,349, Cl. 74-507.000.
Helan Iron Works, Ltd.: *See*—
Suzuki, Yukitomo, 4,313,478, Cl. 144-1.00A.
Hell, August; Borowski, Kurt; Cocron, Istvan; and Huber, Theodor, to Agfa-Gevaert AG. Focussing system with automatic control of emitted radiant power. 4,313,655, Cl. 354-25.000.
Henderson, Donald L., Sr., to Burroughs Corporation. Method of fabricating a charge transfer channel covered by a stepped insulating layer. 4,313,253, Cl. 29-571.000.
Henderson, James M.: *See*—
Petersen, Clifford W.; Bednar, John M.; Hocker, Edwin J., Jr.; Gauger, David H.; and Henderson, James M., 4,314,365, Cl. 367-82.000.

Hendriks, Petrus F. A. M.; Jansen, Arie; van den Berg, Willem B.; and Hoek, Cornelis, to Unie Van Kunstmestfabrieken, B.V. Process and device for the preparation of a product containing ammonium orthophosphate, and product obtained by this process. 4,313,918, Cl. 423-310.000.

Henning, William A.; and Linebarger, Henry F., to Union Carbide Corporation. Method for adding unalloyed magnesium metal to molten cast iron. 4,313,758, Cl. 75-130.00R.

Henriques, Joseph. Oil burner diffuser. 4,313,721, Cl. 431-265.000.

Hercules Incorporated: *See—*
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Herman, Frederick L.; and Dixon, Dale D., to Air Products and Chemicals, Inc. Monomeric compounds having vinyl and imidazolidin-2-one terminal groups. 4,314,067, Cl. 548-320.000.

Herman, Michel M. Device for removing and/or re-installing manhole lids on an apparatus under pressure. 4,313,709, Cl. 414-684.300.

Hermann Hemscheidt Maschinenfabrik GmbH & Co.: *See—*
Maykemper, Alfred; Schorradt, Gerhard; and Werth, Gunter, 4,313,698, Cl. 405-296.000.

Hermann Rappold & Co. GmbH: *See—*
Muller, Rudolf; Kuckertz, Hans; and Marx, Erich, 4,313,724, Cl. 432-217.000.

Hestad, Alfred M.; Tentler, Michael; and Rose, Levi L., to United Networks, Inc.; and Manu-Tronics, Inc. Subscriber station networks. 4,314,107, Cl. 179-81.00R.

Hetzel, Henry T.: *See—*
Carau, Frank P., Sr.; Hetzel, Henry T.; and Tremblay, Michael A., 4,314,096, Cl. 178-19.000.

Heuze, Philippe; and Lambert, Pierre, to Thomson-CSF. Sawtooth-generating circuit. 4,314,183, Cl. 315-389.000.

Hewlett-Packard Company: *See—*
Carau, Frank P., Sr.; Hetzel, Henry T.; and Tremblay, Michael A., 4,314,096, Cl. 178-19.000.
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Paulson, Gary R., 4,314,293, Cl. 360-92.000.

Heyke, Klaus; Schmidt, Gunter; and Ragaly, Istvar, to Robert Bosch GmbH. Two semiconductor diode rectifier structure. 4,314,271, Cl. 357-76.000.

Hibari, Eiko: *See—*
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Hibiya, Tokio: *See—*
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Hickmann, Karl: *See—*
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Hida, Tsuneo: *See—*
Miki, Nobuaki; Kawamoto, Mutsumi; Amano, Hiroyuki; Hida, Tsuneo; and Yoshida, Tsuyoshi, 4,314,340, Cl. 364-424.100.

Hidano, Yoichi: *See—*
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Hieronymus, Hans, to Siemens Aktiengesellschaft. Current feed for a super-conducting magnet coil. 4,314,123, Cl. 200-289.000.

Higuchi, Mitsuo; and Miyasaka, Kiyoshi. Semiconductor memory device. 4,314,360, Cl. 365-203.000.

Hilbourne, Robert A.: *See—*
Groves, Peter H.; and Hilbourne, Robert A., 4,314,167, Cl. 307-540.000.

Hill-Harriss, Stephen P.: *See—*
Crewe, David W.; and Hill-Harriss, Stephen P., 4,314,329, Cl. 364-141.000.

Hill, Jeffrey A.: *See—*
Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; and Leontas, Spiro, 4,313,601, Cl. 271-207.000.

Hill, Robert W.: *See—*
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Himeno, Kiyoshi: *See—*
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Hirayama, Yoshio: *See—*
Ito, Toshio; Matsuoka, Hiromasa; Hirayama, Yoshio; and Takahashi, Nobuyoshi, 4,313,312, Cl. 62-271.000.

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Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,313,939, Cl. 424-180.000.

Hisasue, Michio: *See—*
Kojima, Gen; Tamura, Masayuki; and Hisasue, Michio, 4,314,043, Cl. 525-102.000.

Hitachi, Ltd.: *See—*
Kato, Yukio; Hotta, Atsuo; and Isobe, Teruo, 4,314,359, Cl. 365-179.000.
Nishimiya, Torazo, 4,313,590, Cl. 251-129.000.
Sunahara, Kazuo; and Misumi, Akira. 4,313,854, Cl. 252-516.000.
Suzuki, Yoshihisa; Kaizuka, Takanoli; Hanyu, Yoshiaki; Otake, Mituyoshi; and Hidano, Yoichi, 4,313,989, Cl. 428-64.000.
Tokunaga, Kazuyoshi; Anzai, Masayasu; Hoshi, Nobuyoshi; and Tanno, Kiyohiko, 4,314,257, Cl. 346-74.400.
Yamamoto, Hideaki; Taniguchi, Akio; Horigome, Shinkichi; Saito, Susumu; Mori, Yoshiaki; and Maruyama, Eiichi, 4,314,014, Cl. 430-57.000.
Yamashita, Katsuji; and Nomura, Yasushi, 4,313,735, Cl. 23-230.00R.

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Hobart Brothers Company: *See—*
Muter, Bryce A., 4,314,195, Cl. 322-90.000.

Hobes, John-Victor; and Payer, Wolfgang, to Ruhrchemie Aktiengesellschaft. Method for the preparation of polymer foams. 4,314,035, Cl. 521-77.000.

Hochmuth, William R.: *See—*
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Hocker, Edwin J., Jr.: *See—*
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Hoechst Aktiengesellschaft: *See—*
Gradl, Reinhard; Schrodter, Klaus; and Ehlers, Klaus-Peter, 4,313,826, Cl. 210-114.000.
Koblo, Jochen; and von dem Bussche, Gotz, 4,313,666, Cl. 354-299.000.
Moraw, Roland; and Schadlich, Renate, 4,313,984, Cl. 428-13.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See—*
Martin, Lawrence L.; and Worm, Manfred, 4,313,959, Cl. 424-330.000.

Hoek, Cornelis: *See—*
Hendriks, Petrus F. A. M.; Jansen, Arie; van den Berg, Willem B.; and Hoek, Cornelis, 4,313,918, Cl. 423-310.000.

Hoey, George B.; Murphy, George P.; Wiegert, Philip E.; and Woods, James W., to Mallinckrodt, Inc. 3,5-Disubstituted-2,4,6-triiodoanilides of polyhydroxy-monobasic acids. 4,314,055, Cl. 536-53.000.

Hoffmann, Arthur K.: *See—*
Raghu, Sivaraman; Hoffmann, Arthur K.; and Singh, Balwant, 4,314,066, Cl. 548-320.000.

Hoffmann-La Roche Inc.: *See—*
Fahrenholtz, Kenneth E.; Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., 4,314,085, Cl. 568-644.000.
Wick, Alexander E., 4,314,063, Cl. 546-298.000.

Hojbjerg, Svend, to AS Phonix. Asphalt laying machine. 4,313,690, Cl. 404-114.000.

Hokkai Danro Yugen Kaisha: *See—*
Sato, Kanichi, 4,313,387, Cl. 110-192.000.

Holden, Homer N.; Kleykamp, Donald L.; Moore, William F.; and Mathieu, Julien C., to Dayco Corporation. Pedestal liner for railway vehicle and method of making same. 4,313,384, Cl. 105-225.000.

Holland Bergen op Zoom B.V. Machinefabriek en/IJzergieterij: *See—*
Baas, Hendrik B., 4,313,592, Cl. 251-162.000.

Hollandse Signaalapparaten B.V.: *See—*
Oude Elberink, Bernard H. M.; Damhuis, Gerardus J. M.; and Alink, Han, 4,314,247, Cl. 343-6.5LC.

Holmes, Paul M., to Aeroquip Corporation. Thermally operated valve. 4,313,453, Cl. 137-74.000.

Holt, William G., to Hercules Incorporated. Container. 4,313,546, Cl. 220-74.000.

Holzem, Heinz; and Kehrmann, Helmut, to Pierburg Luftfahrtgerate Union GmbH. Method and control device for dosing flow media. 4,313,465, Cl. 137-599.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Furukawa, Yoshimi; and Sano, Shoichi, 4,313,514, Cl. 180-143.000.

Honda, Hiroyuki: *See—*
Ura, Hiroaki; and Honda, Hiroyuki, 4,313,674, Cl. 355-15.000.

Honda, Keiichi; and Nishijima, Yasushi, to Kanebo Ltd. N-3-(Cis-9-octadecenoyloxy)-2-hydroxypropylamine derivative. 4,313,888, Cl. 260-404.000.

Honeywell Information Systems Inc.: *See—*
Porter, Marion G.; Norman, Robert W., Jr.; and Ryan, Charles P., 4,314,331, Cl. 364-200.000.

Honig, Ernst-August, to Volkswagenwerk Aktiengesellschaft. Control system for an automatic transmission. 4,313,353, Cl. 74-868.000.

Honkala, Risto J.: *See—*
Tuovinen, Frans H.; Honkala, Risto J.; and Metsarinta, Maija-Leena, 4,313,849, Cl. 252-421.000.

Honnen, Lewis R., to Chevron Research Company. Reactor for fast reactions. 4,313,680, Cl. 366-337.000.

Hooper, Orville D. Apparatus for use in fabricating glass lampshades with leaded joints. 4,313,597, Cl. 269-51.000.

Hope, Henry F.; and Hope, Stephen F. Control circuit for a film processing apparatus. 4,313,668, Cl. 354-319.000.

Hope, Stephen F.: *See—*
Hope, Henry F.; and Hope, Stephen F., 4,313,668, Cl. 354-319.000.

Hori, Takanobu; and Hayashi, Masaharu, to Aisin Seiki Kabushiki Kaisha. Viscous fluid coupling. 4,313,531, Cl. 192-58.00B.

Horigome, Shinkichi: *See—*
Yamamoto, Hideaki; Taniguchi, Akio; Horigome, Shinkichi; Saito, Susumu; Mori, Yoshiaki; and Maruyama, Eiichi, 4,314,014, Cl. 430-57.000.

Horsma, David A., to Raychem Corporation. Electrical devices containing PTC elements. 4,314,145, Cl. 219-553.000.

Horten, Carl R., to Ingersoll-Rand Company. Friction rock stabilizer and method for insertion thereof in an earth structure bore. 4,313,696, Cl. 405-259.000.

Hosaka, Akio; and Asano, Masaharu, to Nissan Motor Company Limited. Fuel supply control system. 4,313,412, Cl. 123-480.000.

Hoshi, Nobuyoshi: *See*—
Tokunaga, Kazuyoshi; Anzai, Masayasu; Hoshi, Nobuyoshi; and Tanno, Kiyohiko, 4,314,257, Cl. 346-74.400.
Hosoda, Jun: *See*—
Handa, Ryoji; Yoshida, Norimasa; Hosoda, Jun; and Furuno, Akihisa, 4,313,863, Cl. 260-29.60E.
Hosono, Takashi: *See*—
Tooyama, Akira; and Hosono, Takashi, 4,314,179, Cl. 315-12.0ND.
Hossain, M. Bilayet: *See*—
Schmitz, Francis J.; van der Helm, Dick; Hossain, M. Bilayet; Gopichand, Yalamanchili; and Prasad, Ravi S., 4,314,057, Cl. 542-401.000.
Hotta, Atsuo: *See*—
Kato, Yukio; Hotta, Atsuo; and Isobe, Teruo, 4,314,359, Cl. 365-179.000.
Houdaille Industries, Inc.: *See*—
Slawson, Kenneth L., 4,314,330, Cl. 364-192.000.
Hourihan, Joseph C.: *See*—
Barbuscio, Frank D.; Hunter, LeRoy; Hourihan, Joseph C.; Inglis, Mary C.; Oberstar, Helen E.; and Saad, Hosny, 4,313,393, Cl. 116-200.000.
Houston, Owen M.: *See*—
Johns, Robert K.; Deist, Donald W.; and Houston, Owen M., 4,314,344, Cl. 364-500.000.
Houston Well Screen Company: *See*—
Wilson, Hill D.; and Corgey, Norman R., 4,314,129, Cl. 219-58.000.
Howard, Durrell U. Speed responsive trailer stabilizer with zero slack. 4,313,616, Cl. 280-446.00B.
Howmet Turbine Components Corporation: *See*—
Dardi, Louis E.; and Shankar, Srinivasan, 4,313,760, Cl. 106-1.120.
Hrusch, Louis C.: *See*—
Blincoe, Richard A.; and Hrusch, Louis C., 4,313,364, Cl. 91-176.000.
Hsu, Ying Y., to Timex Corporation. 4-Substituted phenyl 4'-(5-n-alkyl-1,3-dioxan-2-yl)benzoates. 4,313,878, Cl. 260-340.700.
Huber, Theodor: *See*—
Hell, August; Borowski, Kurt; Cocron, Istvan; and Huber, Theodor, 4,313,655, Cl. 354-25.000.
Hubner, Otto. Electrically illuminated mirror. 4,314,314, Cl. 362-32.000.
Huebner, Charles F.; and Gschwend, Heinz W., to Ciba-Geigy Corporation. 1,5-Bis(1,4-benzodioxin-2-yl)-3-azapentane-1,5-diols. 4,313,955, Cl. 424-278.000.
Huffhines, Donald F.: *See*—
Guenther, Robert O.; and Huffhines, Donald F., 4,313,392, Cl. 114-244.000.
Huggins, Dale K.; Queneau, Paul B.; and Beckstead, Leo W., to Amax Inc. Autoclave tungstate upgrading of scheelite concentrates. 4,313,914, Cl. 423-58.000.
Hughes Aircraft Company: *See*—
Wang, Harry T. M., 4,314,209, Cl. 331-3.000.
Hughes, Douglas B. Pipe thawing apparatus. 4,314,140, Cl. 219-300.000.
Hughes, Kathleen A.; Kine, Benjamin B.; and Swift, Graham, to Rohm and Haas Company. Process for preparing low molecular weight water-soluble polymers. 4,314,044, Cl. 260-29.60M.
Hughes, Raymond B., to General Electric Company. Laminate composition comprising polyetherimide impregnated fabric. 4,313,999, Cl. 428-251.000.
Huizinga, John S.: *See*—
Stevens, John; Huizinga, John S.; and Newman, Stephen, 4,313,978, Cl. 427-384.000.
Huliba, David A.: *See*—
Bok, Dennis E.; Brown, Mark E.; Hahn, Steven R.; Huliba, David A.; and Wysinski, Thomas M., 4,314,264, Cl. 346-140.00R.
Hull, Frederick H., to Budd Company, The. Environmental testing system. 4,313,347, Cl. 73-669.000.
Hults, Johnathan J. Educational frame device having a rotatable body and rotatable symbol-bearing inserts. 4,313,727, Cl. 434-174.000.
Humphries, John M.; Baxter, Ivor R.; and Fripp, David G. F., to Marconi Company Limited, The. Optical velocity responsive apparatus and arrangements. 4,314,153, Cl. 250-231.0SE.
Hunt, Arlon J., to United States of America, Energy. Radiant energy collection and conversion apparatus and method. 4,313,304, Cl. 60-641.800.
Hunter, Aldridge T.: *See*—
Folmer, Carroll W.; and Hunter, Aldridge T., 4,313,581, Cl. 244-110.00B.
Hunter, LeRoy: *See*—
Barbuscio, Frank D.; Hunter, LeRoy; Hourihan, Joseph C.; Inglis, Mary C.; Oberstar, Helen E.; and Saad, Hosny, 4,313,393, Cl. 116-200.000.
Huss, Christina L.; and West, Jon K., to General Electric Company. Waste water treatment system and process. 4,313,824, Cl. 210-86.000.
Hydronautics, Incorporated: *See*—
Tulin, Marshall P.; and Santo, John E., 4,313,830, Cl. 210-639.000.
Ichihashi, Yasuhiko: *See*—
Muramatsu, Tadao; and Ichihashi, Yasuhiko, 4,313,617, Cl. 280-661.000.
Ichizawa, Yoshiyuki: *See*—
Suzuki, Sadao; Ichizawa, Yoshiyuki; and Seki, Nobuichi, 4,313,534, Cl. 198-484.000.
ICI Americas Inc.: *See*—
Chasin, David G.; and Zaucha, Thomas J., 4,313,847, Cl. 252-356.000.
Kruse, Walter M.; and Stephen, John F., 4,314,078, Cl. 564-99.000.
ICI Australia Limited: *See*—
Serban, Alexander; Watson, Keith G.; and Barton, John E. D., 4,314,065, Cl. 548-222.000.
Ide, Akira: *See*—
Doi, Tsunesuke; Ide, Akira; and Kishimoto, Yasushi, 4,314,048, Cl. 528-44.000.
Idemoto, Noboru; Yamada, Minoru; Tashiro, Mamoru; and Matsushita, Sachio, to Fuji Photo Film Co., Ltd. Electrodialyzer and method of regenerating waste photographic processing solution. 4,313,808, Cl. 204-180.00P.
Igel, Wolfgang: *See*—
Gunkinger, Siegfried; Weeger, Hans-Peter; Kriechbaum, Kurt; and Igel, Wolfgang, 4,313,299, Cl. 57-267.000.
Iguchi, Eiko: *See*—
Komori, Tadaaki; Yamashita, Michio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,313,935, Cl. 424-115.000.
Ihle Ingenieurgesellschaft mbH: *See*—
Schniewind, Manfred, 4,313,340, Cl. 73-61.400.
Iizuka, Haruhiko; and Sugasawa, Fukashi, to Nissan Motor Company, Limited. Multi-cylinder internal combustion engine. 4,313,406, Cl. 123-198.00F.
Ijuin, Noriaki: *See*—
Teramoto, Toshio; Ijuin, Noriaki; and Kotani, Teizo, 4,313,865, Cl. 260-31.40R.
Ikeda, Hironosuke; and Nakaido, Shigehiro, to Sanyo Electric Co., Ltd. Battery. 4,314,009, Cl. 429-161.000.
Ikeda, Nobuo: *See*—
Yoshimura, Hirofumi; Tanaka, Junzo; and Ikeda, Nobuo, 4,314,126, Cl. 219-10.55R.
Ikeda, Toshimitsu: *See*—
Matsumoto, Shoji; Matsui, Toshikazu; Ikeda, Toshimitsu; Kozuka, Nobuhiko; Nishihama, Hitoshi; and Aizawa, Tatsuo, 4,314,018, Cl. 430-125.000.
Ikemoto, Isao: *See*—
Kuru, Hiroshi; Akiyama, Mitsuo; and Ikemoto, Isao, 4,314,242, Cl. 340-617.000.
Ikuzawa, Masanori: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,313,939, Cl. 424-180.000.
Illinois Tool Works Inc.: *See*—
Gaber, Martin, 4,314,121, Cl. 200-67.00G.
Imahori, Seiichi; Himeno, Kiyoshi; and Maeda, Shuichi, to Mitsubishi Chemical Industries Limited. Mono-azo compound, mono-azo dye and dyeing process for polyester fibers. 4,313,731, Cl. 8-451.000.
Imai, Masafumi: *See*—
Ueno, Hiroshi; Imai, Masafumi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,314,046, Cl. 526-125.000.
Imai, Shozaburo; Suzuki, Haruo; Asai, Kuniaki; and Ueno, Katsuji, to Sumitomo Chemical Company, Limited. Process for producing polycondensates. 4,313,870, Cl. 260-40.00R.
Imamura, Hiroyuki: *See*—
Kojima, Tamotsu; Imamura, Hiroyuki; Fujiwhara, Mitsuto; Fujimatsu, Wataru; and Endo, Takaya, 4,314,023, Cl. 430-389.000.
Imanaka, Hiroshi: *See*—
Komori, Tadaaki; Yamashita, Michio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,313,935, Cl. 424-115.000.
Imbach, Jean-Louis: *See*—
Oiry, Joel; and Imbach, Jean-Louis, 4,314,076, Cl. 564-33.000.
Imperial Chemical Industries Limited: *See*—
Boyd, Violet; Fishwick, Brian R.; and Glover, Brian, 4,313,874, Cl. 260-207.000.
Crooks, Graham R., 4,314,073, Cl. 562-416.000.
Imperiali, Franco: *See*—
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Inaba, Naomi: *See*—
Ueno, Hiroshi; Imai, Masafumi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,314,046, Cl. 526-125.000.
Inada, Masami; and Aoki, Kongou, to Aisin Seiki Kabushiki Kaisha. Electromagnetic valve assembly. 4,313,366, Cl. 91-459.000.
Inagaki, Junichi: *See*—
Kondow, Ryotaro; and Inagaki, Junichi, 4,314,301, Cl. 361-65.000.
Inca-One Corporation: *See*—
Roberts, George C., 4,313,233, Cl. 4-321.000.
Industrial Insulations Inc.: *See*—
Frahme, Carl E., 4,313,789, Cl. 162-152.000.
Industrial Nuclear Company, Inc.: *See*—
Gaines, Thomas M., 4,314,157, Cl. 250-497.000.
Ingard, Karl U.: *See*—
Gorchev, Dimiter; and Ingard, Karl U., 4,313,522, Cl. 181-224.000.
Ingersoll-Rand Company: *See*—
Horten, Carl R., 4,313,696, Cl. 405-259.000.
McCartney, Clifford A., 4,313,695, Cl. 405-259.000.
Inglis, Mary C.: *See*—
Barbuscio, Frank D.; Hunter, LeRoy; Hourihan, Joseph C.; Inglis, Mary C.; Oberstar, Helen E.; and Saad, Hosny, 4,313,393, Cl. 116-200.000.
Inoue Gomu Kogyo Kabushika Kaisha: *See*—
Narita, Kozi, 4,313,985, Cl. 428-31.000.
Inoue, Mitsumasa: *See*—
Moriyama, Akinobu; Inoue, Mitsumasa; Saito, Masaaki; and Kawamura, Yoshihisa, 4,313,411, Cl. 123-445.000.
Institut Cerac S.A.: *See*—
Raybould, Derek, 4,313,759, Cl. 75-249.000.

Institut Dr. Friedrich Forster Prufgeratebau: *See*—
Haberlein, Peter, 4,314,203, Cl. 324-262.000.
Institut National de La Sante et de La Recherche Medicale: *See*—
Descamps-Latscha, Beatrice, 4,314,026, Cl. 435-7.000.
International Business Machines Corporation: *See*—
Andros, Frank E.; and Shay, Robert J. E., 4,313,492, Cl. 165-104.260.
Bergeron, David L.; and Stephens, Geoffrey B., 4,314,267, Cl. 357-43.000.
Briska, Marian; Metzger, Gert; and Thiel, Klaus P., 4,313,773, Cl. 148-188.000.
Brown, Earl T.; and Cavill, Barry R., 4,313,683, Cl. 400-225.000.
Demke, Kent R.; Dwire, Jerold D.; Ko, Michael A.; and Mumola, Joanne L., 4,314,244, Cl. 340-731.000.
Gonzales, Frank, Jr.; and Sobon, Joseph, 4,313,900, Cl. 264-61.000.
Haynes, Munro K., 4,314,289, Cl. 360-77.000.
International Flavors & Fragrances Inc.: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,313,842, Cl. 252-174.110.
International Minerals & Chemical Corp.: *See*—
Shipchandler, Mohammed T., 4,314,080, Cl. 564-224.000.
International Refining Equipment: *See*—
Haley, Floyd C., 4,313,784, Cl. 159-6.00W.
International Shoe Machine Corporation: *See*—
Runions, Sinville, 4,313,395, Cl. 118-411.000.
International Telephone and Telegraph Corporation: *See*—
Eldridge, Raymond W.; and Winter, David F., 4,314,093, Cl. 174-73.00R.
INTERx Research Corp.: *See*—
Bodor, Nicholas S.; Sloan, Kenneth B.; and Pogany, Stefano A., 4,313,956, Cl. 424-301.000.
Iowa State University Research Foundation, Inc.: *See*—
Stahr, Henry M., 4,314,027, Cl. 435-34.000.
Ishida, Hiroshi: *See*—
Kawada, Shigeki; and Ishida, Hiroshi, 4,314,191, Cl. 318-802.000.
Ishida, Torao: *See*—
Shibuya, Chisei; Ishii, Kunihiko; Sano, Takumi; and Ishida, Torao, 4,314,059, Cl. 544-27.000.
Ishida, Toshihiko; and Satoh, Takateru, to TDK Electronics Co., Inc. Pad assembly for use in a magnetic tape cassette. 4,314,299, Cl. 360-130.330.
Ishihara Sangyo Kaisha, Ltd.: *See*—
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Someya, Sinzo; and Sakashita, Nobuyuki, 4,314,069, Cl. 560-62.000.
Ishii, Kunihiko: *See*—
Shibuya, Chisei; Ishii, Kunihiko; Sano, Takumi; and Ishida, Torao, 4,314,059, Cl. 544-27.000.
Ishiki, Minoru: *See*—
Oizumi, Masayuki; Goto, Masana; Ishiki, Minoru; and Uozumi, Shoji, 4,314,002, Cl. 428-414.000.
Ishizawa, Shizuo: *See*—
Kunii, Kazuya; Tsutsumi, Saburo; and Ishizawa, Shizuo, 4,313,410, Cl. 123-432.000.
Isoard, Bernard: *See*—
Claret, Jean P.; and Isoard, Bernard, 4,313,576, Cl. 242-18.0PW.
Isobe, Teruo: *See*—
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Italiana S.p.A. Indesit Industria Elettromdomestici: *See*—
Belisomi, Pietro, 4,314,375, Cl. 455-158.000.
Itek Corporation: *See*—
Milamed, Robert L., 4,313,749, Cl. 65-43.000.
Ito, Katsuo; and Yoshimura, Kazunori, to Murata Manufacturing Co., Ltd. Fixing structure of electronic component. 4,314,220, Cl. 336-65.000.
Ito, Sadayoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Water preventing structure in a drum-in-disc brake. 4,313,528, Cl. 188-218.00A.
Ito, Toshio; Matsuoka, Hiromasa; Hirayama, Yoshio; and Takahashi, Nobuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Water producing air conditioning system. 4,313,312, Cl. 62-271.000.
Itoh, Akira. Apparatus for applying a mixture of air and vapor to the face or hair. 4,314,138, Cl. 219-276.000.
ITT Industries, Inc.: *See*—
Berisch, Volker, 4,313,642, Cl. 303-6.00C.
Gille, Gunther; Goertler, Horst; Prohaska, Hans; and Rachner, Horst, 4,314,186, Cl. 318-434.000.
Pickel, Hajo, 4,313,527, Cl. 188-73.320.
IVAC Corporation: *See*—
Georgi, Heinz W., 4,313,445, Cl. 128-680.000.
Ivanov, Alexei I.: *See*—
Gotovtseva, Ljubov A.; Konkova, Maia B.; Garbuz, Tatyana F.; Bunin, Oleg A.; Osminin, Evgeny A.; Zabavina, Nina A.; Ivanov, Alexei I.; Snopov, Vladimir P.; and Batkov, Alexandr I., 4,313,235, Cl. 8-149.100.
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, to Nissan Motor Company, Limited. Downshift valve in hydraulic transmission control system. 4,313,354, Cl. 74-869.000.
Iwasaki Tsushinki Kabushiki Kaisha: *See*—
Sekiguchi, Koichi; and Yamamoto, Kazuyuki, 4,314,109, Cl. 179-99.00M.
Iwasawa, Teruo: *See*—
Nakajima, Yoshio; Takayama, Shuichi; Tsuboshima, Kosaku; Iwasawa, Teruo; and Yamazaki, Masafumi, 4,314,150, Cl. 250-201.000.
Iwata, Kazuhide: *See*—
Shibayama, Shigeki; Iwata, Kazuhide; and Okuda, Nobuo, 4,314,333, Cl. 364-200.000.
Iwatani, Shiro, to Mitsubishi Denki Kabushiki Kaisha. Hybrid thick film integrated circuit heat dissipating and grounding assembly. 4,314,270, Cl. 357-75.000.
Jackson, Francis B.: *See*—
Mabery, Thomas L.; and Jackson, Francis B., 4,314,130, Cl. 219-58.000.
Jackson, Frederick P.; and Newell, Brian, to Prestige Group Limited, The. Pressure cooker relief valve and pressure cookers incorporating such assemblies. 4,313,371, Cl. 99-337.000.
Jackson, William J. Unloader for storage bins. 4,313,705, Cl. 414-312.000.
Jacobs, Cornelis A. J.; Schellen, Johannes A. T.; and Kuus, Gijsbert, to U.S. Philips Corporation. Method vapor discharge lamp having specific range of xenon pressures. 4,314,175, Cl. 313-174.000.
Jaeschke, Harold R.: *See*—
Boyle, Daniel J.; and Jaeschke, Harold R., 4,313,556, Cl. 229-38.000.
James, Larry R., to Allis-Chalmers Corporation. Adjustable mount for a belt idler pulley. 4,313,729, Cl. 474-135.000.
Janome Sewing Machine Co. Ltd.: *See*—
Hanyu, Susumu; Morimoto, Shyuzo; and Sano, Yasuro, 4,313,389, Cl. 112-158.00A.
Jansen, Arie: *See*—
Hendriks, Petrus F. A. M.; Jansen, Arie; van den Berg, Willem B.; and Hoek, Cornelis, 4,313,918, Cl. 423-310.000.
Jansen, Pierre G.; Kessels, Jozef L. W.; and Waumans, Benny L. A., to U.S. Philips Corporation. Data buffer memory of the first-in, first-out type comprising a fixed input and a variable output. 4,314,361, Cl. 365-221.000.
Janssen, Manfred; Austermann, Karl; and Schmidt, Volker, to Mannesmann Aktiengesellschaft. Providing cardan and universal joint-type shafts with gearing. 4,313,328, Cl. 72-276.000.
Janssen Pharmaceutica, N.V.: *See*—
Heeres, Jan; and Mostmans, Joseph H., 4,313,953, Cl. 424-269.000.
Janssen, Sylvain; Tourret, Jean; Zarudiansky, Alain; and Allesch, Roland, to Schlumberger Technology Corp. Borehole logging tool cryostat. 4,313,317, Cl. 62-514.00R.
Japan Synthetic Rubber Co., Ltd.: *See*—
Shimokawa, Shin-ichi; and Yamamoto, Yuji, 4,314,041, Cl. 525-53.000.
Teramoto, Toshio; Ijuin, Noriaki; and Kotani, Teizo, 4,313,865, Cl. 260-31.40R.
Jeffries, John A.; and Ruch, Mark H., to Texas Instruments Incorporated. Fluid-insulated universal flexible acoustic coupler muff system. 4,314,099, Cl. 179-1.00C.
Jenaer, Glaswerk, Schott & Gen.: *See*—
Juras, Karl-Heinz, 4,313,746, Cl. 65-25.400.
Jensen, Kenneth D., to Midland-Ross Corporation. Hydraulic brake booster pressure limiter. 4,313,454, Cl. 137-101.000.
Jere B. Ford, Inc.: *See*—
Ford, Jere B., Jr., 4,313,780, Cl. 156-523.000.
Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Everett, Patrick N., 4,314,210, Cl. 372-18.000.
JH Industries, Inc.: *See*—
Johnson, Dwight N., 4,313,460, Cl. 137-489.000.
Johnson, Dwight N., 4,313,469, Cl. 137-637.000.
Johns Hopkins University, The: *See*—
Feldman, Charles; Charles, Harry K.; and Satkiewicz, Frank G., 4,313,254, Cl. 29-572.000.
Johns, Robert K.; Deist, Donald W.; and Houston, Owen M., to Dasibi Environmental Corporation. Method and apparatus for generating selected gas concentrations. 4,314,344, Cl. 364-500.000.
Johnson, Don R., to Harris & Thrush Manufacturing Company. Latch for module builder. 4,313,631, Cl. 292-201.000.
Johnson, Dwight N., to JH Industries, Inc. Pilot valve. 4,313,460, Cl. 137-489.000.
Johnson, Dwight N., to JH Industries, Inc. Faucet assembly with pinch valves. 4,313,469, Cl. 137-637.000.
Johnson, Harlan B.; and Chamberlin, Ronald D., to PPG Industries, Inc. Fixed bed oxygen depolarized cathode chlor-alkali cell. 4,313,813, Cl. 204-263.000.
Johnson, James S., Jr.; and Westmoreland, Clyde G., to United States of America, Energy. Sacrificial adsorbate for surfactants utilized in chemical floods of enhanced oil recovery operations. 4,313,500, Cl. 166-273.000.
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Exley, Vern R., 4,313,643, Cl. 303-71.000.
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Breitenbach, Otto, 4,314,168, Cl. 310-13.000.
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Umaba, Takayuki, 4,314,292, Cl. 360-86.000.
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Sato, Yo, 4,313,377, Cl. 101-295.000.
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Wischniewski, Martin; Feicho, Lutz; and Althaus, Werner, 4,313,930, Cl. 424-32.000.
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Kallenberger, Robert H.; and Anderson, John E., to Phillips Petroleum Company. Apparatus for producing carbon black. 4,313,723, Cl. 432-37.000.
Kanatani, Frank N., to United States of America, Health, Education and Welfare. Steel wire pressure aesthesiometer. 4,313,446, Cl. 128-744.000.
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Takahashi, Tohru; Toyono, Tsutomu; Kanbe, Junichiro; Nakamura, Shunji; and Tamura, Yasuyuki, 4,314,017, Cl. 430-109.000.
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Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
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Kao Soap Co., Ltd.: *See*—
Yasuda, Shinichiro, 4,314,049, Cl. 528-128.000.
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Kaun, Thomas D.; and Eshman, Paul F., to United States of America, Energy. Method for manufacturing an electrochemical cell. 4,313,259, Cl. 29-623.200.
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Kawai Musical Instruments Mfg. Co., Ltd.: *See*—
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Kawai, Yoichi; Sasagawa, Katsuyoshi; Maki, Masami; Ueda, Hozumi; and Miyamoto, Masayoshi, to Mitsui Toatsu Chemicals, Inc. Polypropylene composition containing a 1.3,2.4-di(alkylbenzylidene) sorbitol. 4,314,039, Cl. 525-1.000.
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Kawase, Akira; Takouchi, Masao; Tsuji, Yoshio; Mitsumeri, Sadao; and Miyazaki, Susumu, to Tokyo Gas Co. Ltd.; and Hitachi Seisakusho Co., Ltd. Forced air unit. 4,313,493, Cl. 165-122.000.
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Keller, Robert J., III; Fox, Brian G.; and Korec, Benjamin A., 4,313,350, Cl. 74-526.000.
Keller Corporation, The: *See*—
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Keller, George E., II: *See*—
Jones, Robert A., Jr.; Marcinkowsky, Arthur E.; and Keller, George E., II, 4,313,916, Cl. 424-226.000.
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Kenny, Andrew A., to Eaton Corporation. Temperature control system and thermally responsive electro-vacuum relay therefor. 4,313,561, Cl. 237-12.30A.
Kenyon, William E., to Schlumberger Limited. Method of generating subsurface characteristics models. 4,314,339, Cl. 364-422.000.
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Khoobiar, Sargis, to Atlantic Richfield Company. Process for producing methacrylic acid. 4,314,074, Cl. 562-535.000.
Kierstead, Richard W.: *See*—
Fahrenholtz, Kenneth E.; Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., 4,314,085, Cl. 568-644.000.
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Kim, Chong Y.; and Sternberg, Moshe M., to Miles Laboratories, Inc. Production of low cholesterol casein. 4,313,962, Cl. 426-35.000.
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Kimura, Tomohiko: *See*—
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Kimura, Tsutomu; and Miyoshi, Hitoshi, to Fuji Photo Film Co., Ltd. Form combining and recording device. 4,314,357, Cl. 364-900.000.

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King, Patrick D., to Flo-Con Systems, Inc. Shroud support and method for shroud engagement with teeming valve. 4,313,596, Cl. 266-207.000.
Kingston, Katherine A., to Dennison Manufacturing Company. Heat transfer labeling. 4,313,994, Cl. 428-200.000.
Kinney, Philip C.: *See*—
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Kircher, Morton S., to Olin Corporation. Membrane electrode pack cells designed for medium pressure operation. 4,313,812, Cl. 204-253.000.
Kirchweger, Karl: *See*—
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Kirisawa, Noriaki, to Fuji Electric Co., Ltd. Coin-dispensing device. 4,313,450, Cl. 133-5.00R.
Kishi, Hiroyasu: *See*—
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Kivela, Gary G., to Sperry Corporation. Aircraft automatic pilot with automatic emergency descent control apparatus. 4,314,341, Cl. 364-433.000.
Kiwala, Jacob: *See*—
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Kiyohara, Takehiko: *See*—
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Kiyonoga, Kazuo, to Union Carbide Corporation. Process for upgrading iron ore pellets. 4,313,756, Cl. 75-3.000.
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Klawitter, Ronald R., to Steven Manufacturing Company. Floatable toy. 4,313,277, Cl. 46-95.000.
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Klein, Erich; and Rojahn, Willi, to Dragoco Gerberding & Co. GmbH. Fixative for perfume compositions. 4,313,855, Cl. 252-522.00R.
Klein, Richard F. Fluid balancing system for tank vehicle. 4,313,566, Cl. 239-172.000.
Klein, Robert R.: *See*—
Lundberg, Robert D.; Makowski, Henry S.; O'Brien, Dennis; and Klein, Robert R., 4,313,862, Cl. 260-29.6SQ.
Klenk, Herbert; Wirthwein, Rolf; Siekmann, Gerd; and Schwerdtel, Wulf, to Degusa AG; and Bayer Aktiengesellschaft. Process for the manufacture of very pure ϵ-caprolactone. 4,313,879, Cl. 260-343.000.
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Klingbiel, Richard T.: *See*—
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Klumb, Ralph H.; Margotta, Kenneth V.; and Shendy, Divakar S., to Combustion Engineering, Inc. Machine for removing in-core instrument assemblies from a nuclear reactor. 4,313,793, Cl. 376-260.000.
Knauer, Karl; and Pfleiderer, Hans-Joerg, to Siemens Aktiengesellschaft. Input stage for a charge transfer device (CTD) arrangement. 4,314,163, Cl. 307-221.00D.
Knipp, Ulrich: *See*—
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Knudson, Mark B.; and Amundson, David C., to Cardiac Pacemakers, Inc. Atrial rate sensitive cardiac pacer apparatus. 4,313,442, Cl. 128-419.0PG.
Ko, Michael A.: *See*—
Demke, Kent R.; Dwire, Jerold D.; Ko, Michael A.; and Mumola, Joanne L., 4,314,244, Cl. 340-731.000.
Kobayashi, Isao; Akimoto, Hideo; Takahashi, Yoshiyuki; Hibiya, Tokio; and Hata, Masayuki, to Konishiroku Photo Industry Co., Ltd. Apparatus for detecting remaining quantity of toner in electrophotographic copying machine. 4,313,343, Cl. 73-290.00V.
Kobayashi, Kyoji; Kosaka, Takaichi; Takahara, Sigeki; and Tamura, Akira, to Fujitsu Limited; and Fuji Kaden Co., Ltd. Cooling system. 4,313,310, Cl. 62-175.000.
Kobayashi, Makoto: *See*—
Saito, Shunjiro; Nakamura, Akio; and Kobayashi, Makoto, 4,313,814, Cl. 204-290.00F.
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Kocks Technik GmbH & Co.: *See*—
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Kolos, Vladimir K.: *See*—
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Komori, Tadaaki; Yamashita, Michio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, to Fujisawa Pharmaceutical Co., Ltd. Antibiotic FR-900129 substance, a process for the preparation thereof and pharmaceutical compositions containing the same. 4,313,935, Cl. 424-115.000.
Kondo, Iwao; and Shioda, Toshiyuki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Sand mold-producing method and apparatus. 4,313,486, Cl. 164-38.000.
Kondo, Sadao; and Kishi, Hiroyasu, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Noise removing apparatus. 4,314,377, Cl. 455-223.000.
Kondow, Ryotaro; and Inagaki, Junichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Protective relaying devices. 4,314,301, Cl. 361-65.000.
Konishi, Masataka: *See*—
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Kopecky, Eugene F. Adjustable pressure extrusion pump. 4,313,717, Cl. 418-48.000.
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Korec, Benjamin A.: *See*—
Keller, Robert J., III; Fox, Brian G.; and Korec, Benjamin A., 4,313,350, Cl. 74-526.000.
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Koshar, Robert J.; and Bany, Stephen W., to Minnesota Mining and Manufacturing Company. Epoxypolysiloxane release coatings for adhesive materials. 4,313,988, Cl. 428-40.000.
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Yoshioka, Takakazu; and Kurozumi, Masayuki, 4,314,268, Cl. 357-48.000.
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Tazaki, Shigemitsu; Okamura, Shigeru; and Kyogoku, Hiroshi, 4,313,684, Cl. 400-322.000.
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Schneider, Franz; and Schumann, Burkhard, 4,314,185, Cl. 318-85.000.
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Fleckenstein, Andrew J.; and Mortl, Michael C., 4,313,825, Cl. 210-89.000.
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Llabres, Raymond; Antoine, Robert; Lacotte, Jean P.; and Marchi, Charles, 4,313,718, Cl. 425-290.000.
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Myers, Bert R., Jr., 4,313,798, Cl. 202-234.000.
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Eck, Leonard F.; and Lamb, Michael, 4,313,336, Cl. 72-458.000.
Lamb, Thomas R. Seam-covering device. 4,313,991, Cl. 428-131.000.
Lambert, Pierre: *See*—
Heuze, Philippe; and Lambert, Pierre, 4,314,183, Cl. 315-389.000.
Lambie, John W., to Neptune Glenfield Limited. Gate valves. 4,313,593, Cl. 251-327.000.
Lamm, Helmut: *See*—
Poeschl, Guenter, 4,313,420, Cl. 126-429.000.
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Kaiser, Roman; and Lamparsky, Dietmar, 4,313,856, Cl. 252-522.00R.
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Muntjanoff, John R.; and Lanchantin, Charles E., Jr., 4,313,633, Cl. 294-88.000.
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Lang, Armin, to Zahnradfabrik Friedrichshafen, AG. Control valve. 4,313,467, Cl. 137-625.300.
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Thir, Basil; Newkirk, David D.; Eisenstein, Stephen E.; and Langdon, William K., 4,314,000, Cl. 428-265.000.
Langley, Robert: *See*—
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Larson, Willis A., to Oak Industries. Laminated membrane switch. 4,314,114, Cl. 200-5.00A.

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Matthews, John W., 4,313,272, Cl. 42-1.00A.
Matthews, John W.; and Fraer, Michael J., 4,313,273, Cl. 42-1.00A.

Lau, Ka K. Wok burner. 4,313,416, Cl. 126-39.00E.

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Brown, James P.; and Laughlin, Robert G., 4,314,060, Cl. 544-171.000.

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Zurbuchen, Jacques; Lauton, Alain; and Luttringer, Jean P., 4,313,733, Cl. 8-582.000.

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Bakka, Raymond; and Dieudonne, Marc P. G., 4,314,367, Cl. 370-60.000.

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Habal, Mutaz B.; and Leake, Donald L., 4,313,232, Cl. 3-1.910.

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Smith, William V., 4,314,278, Cl. 358-210.000.

Ledford, Thomas H.; and Perez, Raul E., to Exxon Research & Engineering Co. Reducing ash content of molten sulfur. 4,313,922, Cl. 423-578.00R.

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Lee, Alan S., to English Electric Company Limited, The. Turbine and like rotary machines. 4,313,711, Cl. 415-7.000.

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Haaf, William R.; and Lee, Gim F., Jr., 4,313,864, Cl. 260-30.60R.

Lehman, Robert D., Jr. Two-stage refrigerator. 4,313,309, Cl. 62-175.000.

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Woodbury, Henry H.; and Lewandowski, Robert S., 4,313,257, Cl. 29-592.00R.

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Thomas, Friedrich W.; Sperzel, Wolfgang; and Petzoldt, Jurgen, 4,314,182, Cl. 315-307.000.

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Ackeret, Peter, 4,313,675, Cl. 355-40.000.

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Lieber, Thomas G. Guitar construction. 4,313,362, Cl. 84-267.000.

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Misson, William W.; Studley, Clarence K.; Oliver, Bernard M.; and Liljenwall, Edward T., 4,314,112, Cl. 200-5.00A.

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Henning, William A.; and Linebarger, Henry F., 4,313,758, Cl. 75-130.00R.

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Vangsted, Arne; and Sorensen, Ejner V., 4,314,141, Cl. 219-348.000.

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Rogov, Viktor F.; Nikiforov, Igor G.; Tatevosian, Ruben A.; Titov, Mikhail Y.; and Lipatov, Nikolai K., 4,313,574, Cl. 241-78.000.

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Littlefield, John B., to AMSTED Industries Incorporated. Composition friction element for a railroad brake shoe. 4,313,869, Cl. 260-38.000.

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Wing, Thomas; and Germain, Lloyd M., 4,314,174, Cl. 310-315.000.

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Llabres, Raymond; Antoine, Robert; Lacotte, Jean P.; and Marchi, Charles, to Thomson-CSF. Method for the manufacture of flexible disks and apparatus for performing this method. 4,313,718, Cl. 425-290.000.

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Loeschen, Lester L., to Kwik-Mount Corporation. Shelf bracket. 4,313,587, Cl. 248-217.200.

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Lois, Lambros. Apparatus for improving the performance of a rotational wind energy conversion system. 4,313,713, Cl. 416-135.000.

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Louzos, Demetrios V., to Union Carbide Corporation. Solid state cell employing an electron donor-embedded anode. 4,314,010, Cl. 429-191.000.

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Lucas Industries Limited: *See—*
Farr, Glyn P. R., 4,313,526, Cl. 188-72.400.
Williams, Malcolm; Southgate, John P.; and Woodhouse, Richard G., 4,314,305, Cl. 361-154.000.

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Sahrbacker, Edward V., 4,314,170, Cl. 310-68.00R.

Lucido, Donald R., to Siemens Medical Laboratories, Inc. Electron applicator for a linear accelerator. 4,314,158, Cl. 250-505.000.

Luckel, Joachim; and Povel, Rolf, to Daimler-Benz Aktiengesellschaft. Control valve for a servo-steering mechanism. 4,313,365, Cl. 91-372.000.

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Florent, Jean; Lunel, Jean; Mancy, Denise; and Vuillemin, Bernard, 4,313,936, Cl. 424-117.000.

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Zurbuchen, Jacques; Lauton, Alain; and Luttringer, Jean P., 4,313,733, Cl. 8-582.000.

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Campagne, Constant J. V. L., 4,313,960, Cl. 426-17.000.

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Engels, Mathijs M. J., 4,313,509, Cl. 177-50.000.

Mabery, Thomas L.; and Jackson, Francis B., to Combustion Engineering, Inc. Method of making variably rifled tubes. 4,314,130, Cl. 219-58.000.

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Mahdjuri, Faramarz S. Solar collector with heat pipe. 4,313,423, Cl. 126-433.000.

Maier, Martin, to Klockner-Humboldt-Deutz AG Zweigniederlassung Fahr. Blade mounting for a rotary mower. 4,313,297, Cl. 56-295.000.

Mairy, Bernard, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Method of improving operation of continuous casting nozzle. 4,313,975, Cl. 427-236.000.

Major, Emery. Fluid control apparatus. 4,313,464, Cl. 137-544.000.

Maki, Masami: *See—*
Kawai, Yoichi; Sasagawa, Katsuyoshi; Maki, Masami; Ueda, Hozumi; and Miyamoto, Masayoshi, 4,314,039, Cl. 525-1.000.

Makino, Niro, to Nippondenso Co. Ltd. Centrifugal rpm governor for fuel-injected internal combustion engines. 4,313,409, Cl. 123-373.000.

Makizono, Masataka: *See—*
Yunoki, Shigeto; and Makizono, Masataka, 4,313,390, Cl. 114-74.00R.

Makowski, Henry S.: *See—*
Lundberg, Robert D.; Makowski, Henry S.; O'Brien, Dennis; and Klein, Robert R., 4,313,862, Cl. 260-29.6SQ.

Malagnoux, Roger; and Grehal, Pierre, to Societe d'Exploitation des Etablissements Pierre Grehal. Pliers for positioning clips forming connecting rings between a wire netting and support wires. 4,313,333, Cl. 72-410.000.

Malinowski, Hans; and Pielsticker, Klaus P., to Schloemann-Siemag Aktiengesellschaft. Straightening machine for metal plate and strip. 4,313,322, Cl. 72-164.000.

Mallinckrodt, Inc.: *See—*
Hoey, George B.; Murphy, George P.; Wiegert, Philip E.; and Woods, James W., 4,314,055, Cl. 536-53.000.

Malloy, Anthony J.: *See—*
Frelin, Frank J.; Kelly, Timm L.; and Malloy, Anthony J., 4,313,769, Cl. 148-6.270.

Malone, James P.: *See—*
Boodman, Leon; and Malone, James P., 4,314,160, Cl. 290-55.000.

Mamiya Koki Kabushiki Kaisha: *See—*
Takazawa, Eiichi, 4,313,647, Cl. 350-164.000.

Man Maschinenfabrik Augsburg-Nurnberg AG: *See—*
Simon, Klaus, 4,313,615, Cl. 280-432.000.

Mancy, Denise: *See—*
Florent, Jean; Lunel, Jean; Mancy, Denise; and Vuillemin, Bernard, 4,313,936, Cl. 424-117.000.

Mann, Arnold; and Collonia, Harald, to VDO Adolf Schindling AG. Device for the control of the traveling speed of a motor vehicle. 4,313,408, Cl. 123-340.000.

Mann, Arnold; and Stier, Bernhard, to VDO Adolf Schindling AG. Device for the control of the traveling speed of a motor vehicle. 4,313,515, Cl. 180-179.000.

Mannesmann Aktiengesellschaft: *See—*
Janssen, Manfred; Austermann, Karl; and Schmidt, Volker, 4,313,328, Cl. 72-276.000.

Manning, George H.: *See—*
Riccio, Pasquale R.; and Manning, George H., 4,314,294, Cl. 360-96.600.

Manu-Tronics, Inc.: *See—*
Hestad, Alfred M.; Tentler, Michael; and Rose, Levi L., 4,314,107, Cl. 179-81.00R.

Marc, H.: *See—*
Kossel, Horst K., 4,313,404, Cl. 123-58.0BB.

Marchi, Charles: *See—*
Llabres, Raymond; Antoine, Robert; Lacotte, Jean P.; and Marchi, Charles, 4,313,718, Cl. 425-290.000.

Marcinkowsky, Arthur E.: *See—*
Jones, Robert A., Jr.; Marcinkowsky, Arthur E.; and Keller, George E., II, 4,313,916, Cl. 423-226.000.

Marconi Company Limited, The: *See—*
Humphries, John M.; Baxter, Ivor R.; and Fripp, David G. F., 4,314,153, Cl. 250-231.0SE.

Marcy Gymnasium Equipment Co.: *See—*
Sullivan, James P., 4,313,602, Cl. 272-73.000.

Marek, Alois, to BBC Brown, Boveri & Company Limited. Method and apparatus for detection of magnetization. 4,314,200, Cl. 324-117.00R.

Margotta, Kenneth V.: *See—*
Klumb, Ralph H.; Margotta, Kenneth V.; and Shendy, Divakar S., 4,313,793, Cl. 376-260.000.

Markley, Joseph M.: *See—*
Markley, Myron D.; and Markley, Joseph M., 4,313,595, Cl. 251-369.000.

Markley, Myron D.; and Markley, Joseph M. Mounting base for motor operated valve. 4,313,595, Cl. 251-369.000.

Markovs, Robert A., to BASF Wyandotte Corporation. Graft polyol RIM system possessing excellent thermal properties. 4,314,038, Cl. 521-167.000.

Markum, Donnie D. Apparatus for motivating animals to move. 4,313,397, Cl. 119-29.000.

Marro, Michael; and Monin, John, to Dynamic Instrument Corporation. Power measuring apparatus. 4,314,201, Cl. 324-127.000.

Martenas, Wayne B., to Sperry Corporation. Constant float attachment apparatus. 4,313,294, Cl. 56-15.800.

Martens, Jurgen: *See—*
Kleemann, Axel; Leuchtenberger, Wolfgang; Martens, Jurgen; and Weigel, Horst, 4,313,894, Cl. 260-465.400.

Marti, Ulrich: *See—*
Feier, Markus; Frey, Raymond; and Marti, Ulrich, 4,314,346, Cl. 364-555.000.

Martin, Dianne L. Tracheotomy and endotracheal tube retainers. 4,313,437, Cl. 128-207.170.

Martin, Lawrence L.; and Worm, Manfred, to Hoechst-Roussel Pharmaceuticals Inc. (Arylmethyl)phenyl-aminocyclohexanols, cyclohexenes and intermediates thereof. 4,313,959, Cl. 424-330.000.

Martin Marietta Corporation: *See—*
Leighou, Robert O.; and Meeks, Leighton A., 4,314,355, Cl. 364-900.000.

Martin, Paul F.: *See—*
Earing, Mason H.; Martin, Paul F.; and Petschke, Glenn H., 4,313,858, Cl. 260-18.0TN.

Martinage, Bernard, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Apparatus for reproducing an image of variable tone density. 4,314,261, Cl. 346-108.000.

Martinez Apeztegui, Juan; and Odriazola Espinosa de los Monteros, Ignacio. Prefabricated spatial structure. 4,313,687, Cl. 403-171.000.

Martinez de Pinillos, Joaquin V.; and Fowlkes, Robert L., to Air Products and Chemicals, Inc. Synthesis of lower alkyl amines. 4,314,084, Cl. 564-480.000.

Martner, Samuel T.; and Arnold, Maurice E., Jr., to Standard Oil Company (Indiana). Distributed charge for seismic prospecting. 4,313,380, Cl. 181-116.000.

Maruyama, Eiichi: *See—*
Yamamoto, Hideaki; Taniguchi, Akio; Horigome, Shinkichi; Saito, Susumu; Mori, Yoshiaki; and Maruyama, Eiichi, 4,314,014, Cl. 430-57.000.
Marx, Erich: *See—*
Muller, Rudolf; Kuckertz, Hans; and Marx, Erich, 4,313,724, Cl. 432-217.000.
Maryland Cup Corporation: *See—*
Weinstein, David, 4,313,965, Cl. 426-139.000.
Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Hagin, Faust, 4,313,351, Cl. 74-687.000.
Heeren, Hermann; and Kraetschmer, Liselotte, 4,313,490, Cl. 165-82.000.
Muller, Eckart, 4,313,407, Cl. 123-276.000.
Mascioli, Rocco L.: *See—*
Beitchman, Burton D.; and Mascioli, Rocco L., 4,314,037, Cl. 521-125.000.
Massey, Lester G.; Brabets, Robert I.; and Abel, William A., to Consolidated Natural Gas Service. Method for separating undesired components from coal by an explosion type comminution process. 4,313,737, Cl. 44-1.00C.
Massingill, John L., to Dow Chemical Company, The. Process for preparing liquid epoxy resins. 4,313,886, Cl. 260-348.150.
Masuda, Senichi; and Sugita, Naoki. Electric dust collector. 4,313,741, Cl. 55-138.000.
Mathe, George L.: *See—*
Nichols, Walter A.; and Mathe, George L., 4,313,339, Cl. 73-56.000.
Mathews, Lester R.: *See—*
Pitman, Donald G., 4,313,455, Cl. 137-119.000.
Mathieu, Julien C.: *See—*
Holden, Homer N.; Kleykamp, Donald L.; Moore, William F.; and Mathieu, Julien C., 4,313,384, Cl. 105-225.000.
Matsuda, Motonobu: *See—*
Matsui, Toru; Matsuda, Motonobu; Ueda, Hiroshi; Nanba, Yasuhiro; and Kuramoto, Yoshio, 4,313,654, Cl. 354-25.000.
Matsui, Toru; Matsuda, Motonobu; Ueda, Hiroshi; Nanba, Yasuhiro; and Kuramoto, Yoshio, to Minolta Camera Kabushiki Kaisha. Automatic rangefinder system for photographic camera with light emitting and receiving means. 4,313,654, Cl. 354-25.000.
Matsui, Toshikazu: *See—*
Matsumoto, Shoji; Matsui, Toshikazu; Ikeda, Toshimitsu; Kozuka, Nobuhiko; Nishihama, Hitoshi; and Aizawa, Tatsuo, 4,314,018, Cl. 430-125.000.
Matsuki, Shigeru: *See—*
Kitamura, Kumpei; Matsuki, Shigeru; and Tanabe, Kozo, 4,313,934, Cl. 424-85.000.
Matsumoto, Shin-ichro: *See—*
Morita, Shiro; Sawai, Masanobu; Matsumoto, Shin-ichro; and Sudo, Tadamitsu, 4,313,929, Cl. 424-12.000.
Matsumoto, Shoji; Matsui, Toshikazu; Ikeda, Toshimitsu; Kozuka, Nobuhiko; Nishihama, Hitoshi; and Aizawa, Tatsuo, to Mita Industrial Company, Ltd. Cleaning process for an electrostatic copying apparatus. 4,314,018, Cl. 430-125.000.
Matsunaga, Kenichi: *See—*
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,313,939, Cl. 424-180.000.
Matsuoka, Hiromasa: *See—*
Ito, Toshio; Matsuoka, Hiromasa; Hirayama, Yoshio; and Takahashi, Nobuyoshi, 4,313,312, Cl. 62-271.000.
Matsuoka, Tomizo; Nitta, Tsuneharu; and Hayakawa, Shigeru, to Matsushita Electric Industrial Co., Ltd. Low-energy-electron-exciting fluorescent display device. 4,314,177, Cl. 313-497.000.
Matsuoka, Tomizo; Nitta, Tsuneharu; and Hayakawa, Shigeru, to Matsushita Electric Industrial Co., Ltd. Low-energy-electron-exciting fluorescent display device. 4,314,178, Cl. 313-497.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Abe, Atsushi; Ogawa, Hisahito; Nishikawa, Masahiro; Sekido, Satoshi; and Hayakawa, Shigeru, 4,313,338, Cl. 73-23.000.
Hayami, Masaaki; and Torikoshi, Seiko, 4,314,058, Cl. 542-455.000.
Matsuoka, Tomizo; Nitta, Tsuneharu; and Hayakawa, Shigeru, 4,314,177, Cl. 313-497.000.
Matsuoka, Tomizo; Nitta, Tsuneharu; and Hayakawa, Shigeru, 4,314,178, Cl. 313-497.000.
Yoshimura, Hirofumi; Tanaka, Junzo; and Ikeda, Nobuo, 4,314,126, Cl. 219-10.55R.
Matsushita, Sachio: *See—*
Idemoto, Noboru; Yamada, Minoru; Tashiro, Mamoru; and Matsushita, Sachio, 4,313,808, Cl. 204-180.00P.
Mattel, Inc.: *See—*
Bernstein, William L.; and Del Principe, Robert M., 4,314,336, Cl. 364-411.000.
Matthews, John C.; and Couch, Robert W., to Fusion Systems Corporation. Method and apparatus for providing low gloss and gloss controlled radiation-cured coatings. 4,313,969, Cl. 427-44.000.
Matthews, John W., to Laser Products Corporation. Laser beam firearm aim assisting methods and apparatus. 4,313,272, Cl. 42-1.00A.
Matthews, John W.; and Fraer, Michael J., to Laser Products Corporation. Firearms and laser beam aim assisting methods and apparatus. 4,313,273, Cl. 42-1.00A.
Matzner, Markus: *See—*
Berger, Mitchell H.; Matzner, Markus; and Tibbitt, James M., 4,314,051, Cl. 528-179.000.
Maurer, Werner, to Karl M. Reich Maschinenfabrik GmbH, Firma. Apparatus for driving fasteners. 4,313,552, Cl. 227-109.000.
Maxwell, Jerrold F.: *See—*
Nassry, Assadullah; Maxwell, Jerrold F.; and Compton, John W., 4,313,836, Cl. 252-32.70E.
Mayer, Jerome F.; and Miller, Stephen J., to Chevron Research Company. Hydrocarbon conversion catalyst and process using said catalyst. 4,313,817, Cl. 208-89.000.
Mayer, Steven T.; and Milner, Ronald E., to Atari, Inc. Apparatus for producing a plurality of audio sound effects. 4,314,236, Cl. 340-384.00E.
Maykemper, Alfred; Schorradt, Gerhard; and Werth, Gunter, to Hermann Hemscheidt Maschinenfabrik GmbH & Co. Hydraulic shield-type support. 4,313,698, Cl. 405-296.000.
Mazzei, Michael E.: *See—*
Filipi, Thomas J.; and Mazzei, Michael E., 4,313,906, Cl. 422-69.000.
McAlaster, Robert J. Solar air collector. 4,313,429, Cl. 126-445.000.
McAlister, Roy E. Heat exchanger. 4,313,427, Cl. 126-441.000.
McCartney, Clifford A., to Ingersoll-Rand Company. Earth structure stabilizing method, and a friction rock stabilizer and an axial extension therefor. 4,313,695, Cl. 405-259.000.
McClellan, Elton: *See—*
Boldt, Donald M.; and McClellan, Elton, 4,313,386, Cl. 110-104.00R.
McClure, Richard J.: *See—*
French, William W.; Lemke, James U.; and McClure, Richard J., 4,314,298, Cl. 360-121.000.
McConnell, Bobby L.: *See—*
Teague, Edward W.; Graham, Louis A.; and McConnell, Bobby L., 4,313,732, Cl. 8-541.000.
McCord, James W. Vapor generating and recovering apparatus. 4,313,311, Cl. 62-197.000.
McCormick, James L. Polystyrene vehicle body protector system. 4,313,987, Cl. 428-40.000.
McCue, John P., to SBR Lab, Inc. Blood preservation anticoagulant solution. 4,314,025, Cl. 435-2.000.
McDonald, Emory W., to Montgomery Elevator Company. Car door safety interlock. 4,313,525, Cl. 187-57.000.
McEntee, John F., to Acurex Solar Corporation. Collapsible structural assembly especially suitable as a solar concentrator. 4,313,422, Cl. 126-426.000.
McFiggans, Robert B.: *See—*
Lowe, Lynnwood; and McFiggans, Robert B., 4,314,102, Cl. 179-2.00A.
McGlory, Joseph J. Laminated insulation. 4,313,993, Cl. 428-178.000.
McGraw-Edison Company: *See—*
Kristofek, Paul J., 4,314,223, Cl. 337-113.000.
McMurtry, Carl H.; Naum, Robert G.; and Forsyth, Paul F., to Kennecott Corporation. Method for manufacture of neutron absorbing article. 4,313,973, Cl. 427-205.000.
McMurtry, David R., to Rolls Royce Limited; and Renishaw Electrical Limited. Method and apparatus for use in co-ordinate measuring machines. 4,313,263, Cl. 33-174.00L.
McNally, Frank X., to National Mine Corporation. Apparatus for the detection of a combustible gas. 4,313,907, Cl. 422-97.000.
McNeir, Ridge W.; and Head, Claude D., III, to Texas Instruments Incorporated. Unsafe machines without safe positions. 4,314,342, Cl. 364-468.000.
McWilliams, Rose M. Method and apparatus for enumerative display and disposal of surgical sponges. 4,313,292, Cl. 53-474.000.
Mead Corporation, The: *See—*
Bok, Dennis E.; Brown, Mark E.; Hahn, Steven R.; Huliba, David A.; and Wysinski, Thomas M., 4,314,264, Cl. 346-140.00R.
Davis, James W., 4,314,159, Cl. 250-561.000.
Donahue, John W.; and Gottman, James F., 4,314,258, Cl. 346-75.000.
Medtronic, Inc.: *See—*
Stokes, Kenneth B., 4,313,448, Cl. 128-785.000.
Meeks, Leighton A.: *See—*
Leighou, Robert O.; and Meeks, Leighton A., 4,314,355, Cl. 364-900.000.
Mellard, George K. Self-actuating variable rate water pipe bleeder. 4,313,452, Cl. 137-62.000.
Mercer, Scott A.: *See—*
Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; and Leontas, Spiro, 4,313,601, Cl. 271-207.000.
Merck & Co., Inc.: *See—*
Baird, John K.; Sandford, Paul A.; and Shim, Jaewon L., 4,313,765, Cl. 106-197.00C.
Bodor, Nicolae S., 4,313,889, Cl. 260-404.000.
Merrick Scale Mfg. Company: *See—*
La Plante, Donald W.; Fairchild, Arthur; and Rebucci, Eugene L., 4,314,241, Cl. 340-603.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
Frank, Frank, 4,313,431, Cl. 128-7.000.
Metsarinta, Maija-Leena: *See—*
Tuovinen, Frans H.; Honkala, Risto J.; and Metsarinta, Maija-Leena, 4,313,849, Cl. 252-421.000.
Metzger, Gert: *See—*
Briska, Marian; Metzger, Gert; and Thiel, Klaus P., 4,313,773, Cl. 148-188.000.
Meyer, Hans R.; and Siegrist, Max, to Ciba-Geigy Corporation. N-Acyl-o-phenylenediamines. 4,313,846, Cl. 252-301.320.
Meyer, Leonard J.: *See—*
Larkin, Mark E.; and Meyer, Leonard J., 4,313,904, Cl. 264-515.000.

MFE Corporation: *See—*
Riccio, Pasquale R.; and Manning, George H., 4,314,294, Cl. 360-96.600.

Michaelson, Robert C.: *See—*
Austin, Richard G.; and Michaelson, Robert C., 4,314,088, Cl. 568-860.000.

Michelet, Daniel: *See—*
Soula, Gerard; and Michelet, Daniel, 4,314,086, Cl. 568-652.000.

Midland-Ross Corporation: *See—*
Jensen, Kenneth D., 4,313,454, Cl. 137-101.000.

Mihara, Teruyoshi: *See—*
Oguro, Takeshi; Mihara, Teruyoshi; Tominaga, Tamotsu; and Takeuchi, Masami, 4,314,226, Cl. 338-4.000.
Tominaga, Tamotsu; and Mihara, Teruyoshi, 4,314,225, Cl. 338-4.000.

Miki, Nobuaki; Kawamoto, Mutsumi; Amano, Hiroyuki; Hida, Tsuneo; and Yoshida, Tsuyoshi, to Aisin-Waner Kabushiki Kaisha. Control of drive train noises during a shift operation of an automatic, variable speed transmission. 4,314,340, Cl. 364-424.100.

Milamed, Robert L., to Itek Corporation. Method for making light-weight mirror facesheets. 4,313,749, Cl. 65-43.000.

Miles Laboratories, Inc.: *See—*
Kim, Chong Y.; and Sternberg, Moshe M., 4,313,962, Cl. 426-35.000.

Miller, Arthur F.: *See—*
Gaylor, V. Frances; Greene, Janice L.; Miller, Arthur F.; and Pichler, Marty A., 4,313,803, Cl. 204-74.000.

Miller, Franklin H., Sr. Alignment and coupling of vehicles. 4,313,264, Cl. 33-264.000.

Miller, Stephen J.: *See—*
Mayer, Jerome F.; and Miller, Stephen J., 4,313,817, Cl. 208-89.000.

Miller, Walter E., Jr., to United States of America, Army. Optical beam scanner. 4,313,651, Cl. 350-355.000.

Millhimes, Wayne L.; and Sheesley, Wilmer L., to AMP Incorporated. Power distribution system. 4,313,646, Cl. 339-156.00R.

Milner, Ronald E.: *See—*
Mayer, Steven T.; and Milner, Ronald E., 4,314,236, Cl. 340-384.00E.

Mims, Bruce L., to Branson Ultrasonics Corporation. Ultrasonic seaming apparatus. 4,313,778, Cl. 156-358.000.

Minnesota Mining and Manufacturing Company: *See—*
Fisch, Richard S., 4,314,022, Cl. 430-326.000.
Koshar, Robert J.; and Bany, Stephen W., 4,313,988, Cl. 428-40.000.
Stevens, John; Huizinga, John S.; and Newman, Stephen, 4,313,978, Cl. 427-384.000.
Watts, Ronald E., 4,313,932, Cl. 424-62.000.

Minolta Camera Kabushiki Kaisha: *See—*
Matsui, Toru; Matsuda, Motonobu; Ueda, Hiroshi; Nanba, Yasuhiro; and Kuramoto, Yoshio, 4,313,654, Cl. 354-25.000.

Minoura, Kazuo; Kiyohara, Takehiko; and Uchiyama, Haruo, to Canon Kabushiki Kaisha. Two-dimensional scanning device having compensation for scanned image strain. 4,314,154, Cl. 250-235.000.

Mirowski, Mieczyslaw: *See—*
Moore, Eric R.; Heilman, Marlin S.; and Kinney, Philip C., 4,314,095, Cl. 174-84.00C.

Misson, William W.; Studley, Clarence K.; Oliver, Bernard M.; and Liljenwall, Edward T., to Hewlett-Packard Company. Keyboard having switches with tactile feedback. 4,314,112, Cl. 200-5.00A.

Misumi, Akira: *See—*
Sunahara, Kazuo; and Misumi, Akira, 4,313,854, Cl. 252-516.000.

Mita Industrial Company, Ltd.: *See—*
Matsumoto, Shoji; Matsui, Toshikazu; Ikeda, Toshimitsu; Kozuka, Nobuhiko; Nishihama, Hitoshi; and Aizawa, Tatsuo, 4,314,018, Cl. 430-125.000.

Mitchell, L. E., Jr. Cotton stripper. 4,313,296, Cl. 56-34.000.

Mitco Corporation: *See—*
Gorchev, Dimiter; and Ingard, Karl U., 4,313,522, Cl. 181-224.000.

Mitsubishi Chemical Industries Limited: *See—*
Imahori, Seiichi; Himeno, Kiyoshi; and Maeda, Shuichi, 4,313,731, Cl. 8-451.000.
Morita, Shiro; Sawai, Masanobu; Matsumoto, Shin-ichro; and Sudo, Tadamitsu, 4,313,929, Cl. 424-12.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Ito, Toshio; Matsuoka, Hiromasa; Hirayama, Yoshio; and Takahashi, Nobuyoshi, 4,313,312, Cl. 62-271.000.
Iwatani, Shiro, 4,314,270, Cl. 357-75.000.

Mitsubishi Jukogyo Kabushiki Kaishi: *See—*
Shiraishi, Yoshihiro; and Ukawa, Naohiko, 4,314,345, Cl. 364-500.000.

Mitsubishi Rayon Co., Ltd.: *See—*
Handa, Ryoji; Yoshida, Norimasa; Hosoda, Jun; and Furuno, Akihisa, 4,313,863, Cl. 260-29.60E.
Sato, Hiroshi; Shigeta, Sadaaki; and Uchida, Hiroyuki, 4,313,844, Cl. 252-193.000.

Mitsui Toatsu Chemicals, Inc.: *See—*
Kawai, Yoichi; Sasagawa, Katsuyoshi; Maki, Masami; Ueda, Hozumi; and Miyamoto, Masayoshi, 4,314,039, Cl. 525-1.000.

Mitsumeri, Sadao: *See—*
Kawase, Akira; Takouchi, Masao; Tsuji, Yoshio; Mitsumeri, Sadao; and Miyazaki, Susumu, 4,313,493, Cl. 165-122.000.

Miura, Hideo, to Toyo Seikan Kaisha, Ltd. Adjusting method and apparatus for a cylindrical article peripheral surface coating machine. 4,313,982, Cl. 427-428.000.

Miwa, Naoto: *See—*
Niwa, Hitoshi; Miwa, Naoto; Suzuki, Masatoshi; and Ouki, Masami, 4,313,810, Cl. 204-195.00S.

Miyagawa, Tuyoshi; and Hibari, Eiko, to Laurel Bank Machine Co., Ltd. Multi-function type sheet counting machine. 4,314,147, Cl. 235-92.0SB.

Miyaji, Yoshimori; Fujiki, Hirokazu; and Takahashi, Fumio, to Tokyo Shibaura Denki Kabushiki Kaisha. Adjusting device for color television camera apparatus. 4,314,272, Cl. 358-10.000.

Miyaki, Takeo; Tenmyo, Osamu; Konishi, Masataka; and Kawaguchi, Hiroshi, to Bristol-Myers Company. Fermentation process for producing tallysomycin compounds. 4,314,028, Cl. 435-77.000.

Miyamoto, Masayoshi: *See—*
Kawai, Yoichi; Sasagawa, Katsuyoshi; Maki, Masami; Ueda, Hozumi; and Miyamoto, Masayoshi, 4,314,039, Cl. 525-1.000.

Miyasaka, Kiyoshi: *See—*
Higuchi, Mitsuo; and Miyasaka, Kiyoshi, 4,314,360, Cl. 365-203.000.

Miyazaki, Susumu: *See—*
Kawase, Akira; Takouchi, Masao; Tsuji, Yoshio; Mitsumeri, Sadao; and Miyazaki, Susumu, 4,313,493, Cl. 165-122.000.

Miyoshi, Hitoshi: *See—*
Kimura, Tsutomu; and Miyoshi, Hitoshi, 4,314,357, Cl. 364-900.000.

Miyoshi, Takeo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel vaporization promoting device for an internal combustion engine. 4,313,413, Cl. 123-549.000.

Mobay Chemical Corporation: *See—*
Lim, In C., 4,313,873, Cl. 260-18.0TN.

Mobil Oil Corporation: *See—*
Garwood, William E.; Voltz, Sterling E.; and Wu, Ellen L., 4,313,821, Cl. 208-245.000.
Guenther, Robert O.; and Huffhines, Donald F., 4,313,392, Cl. 114-244.000.

Mode, Paul, to Nycoil Company. Method of manufacturing a metallic retaining ring for a tube. 4,313,331, Cl. 72-368.000.

Modern-Aire Ventilating, Inc.: *See—*
White, Ralph H., 4,313,562, Cl. 237-55.000.

Mogaki, Katsuo: *See—*
Uchida, Takashi; Sasaki, Takashi; Kikuchi, Shoji; Mogaki, Katsuo; Taguchi, Masahiko; and Takada, Syun, 4,314,011, Cl. 430-17.000.

Mogle, Rodman A.: *See—*
Barnes, Norman S.; and Mogle, Rodman A., 4,313,262, Cl. 29-840.000.

Mojonnier, Harry G.: *See—*
Skoli, Sigmund P.; Ore, William C.; Kemp, David M.; and Mojonnier, Harry G., 4,313,370, Cl. 99-323.100.

Molinari, Franco: *See—*
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Mostmans, Joseph H.: *See*—
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Muntjanoff, John R.; and Lanchantin, Charles E., Jr., to Caterpillar Tractor Co. Self adjusting actuator system. 4,313,633, Cl. 294-88.000.

Muramatsu, Tadao; and Ichihashi, Yasuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Camber adjusting device in strut type suspension system. 4,313,617, Cl. 280-661.000.

Murata Manufacturing Co., Ltd.: *See*—
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Murayama, Naohiro; and Sakagami, Teruo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Crosslinked polyvinyl alcohol gel. 4,314,032, Cl. 521-52.000.

Murdock, Keith C.; Damiani, Martin R.; and Durr, Frederick E. Certain 3,6-bis-(heteroaminoalkoxy) acridines. 4,314,061, Cl. 544-80.000.

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Muter, Bryce A., to Hobart Brothers Company. Solid state control for motor-generator welder. 4,314,195, Cl. 322-90.000.

Myers, Bert R., Jr., to Lakehurst Galleries, Ltd. Micro-wave powered distillation unit. 4,313,798, Cl. 202-234.000.

Myint, U. Hla, to Dow Chemical Company, The. Apparatus for evaluating the impact resistance of synthetic resinous products. 4,313,337, Cl. 73-12.000.

Mylander, Gerald D. Automatic fill-stop valve. 4,313,459, Cl. 137-416.000.

Nagai, Masanori: *See*—
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Namiki, Ryoichi, to Ricoh Company, Ltd. Method of forming a roll protective layer. 4,313,981, Cl. 427-409.000.

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Nassry, Assadullah; Maxwell, Jerrold F.; and Compton, John W., to BASF Wyandotte Corporation. Water-based hydraulic fluid and metalworking lubricant. 4,313,836, Cl. 252-32.70E.

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Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, to Roussel Uclaf. Cycloheptindoles, compositions and use. 4,313,944, Cl. 424-248.400.
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Nishimiya, Torazo, to Hitachi, Ltd. Solenoid valve for controlling flow of fluid. 4,313,590, Cl. 251-129.000.
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Salisbury, Winfield W., 4,314,180, Cl. 376-130.000.
Ochirov, Vasily A.: *See*—
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O'Connor, Joseph M., to Peerless of America, Inc. Extrusion die for forming multi-passage tubular members. 4,313,327, Cl. 72-265.000.
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Tsai, Shirley C.; Graham, Richard H.; and Oder, Robin R., 4,313,499, Cl. 166-248.000.
Odone, Giovanni; and Buchs, Willy. Portable electronic alarm device. 4,314,239, Cl. 340-556.000.
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Suzuki, Ichiro; Ogawa, Hisashi; and Motonami, Masanao, 4,313,622, Cl. 280-804.000.
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Crackel, Lawrence E.; and Oglesby, Lloyd S., 4,313,425, Cl. 126-438.000.
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Ohlson, Kjell F. Rear light unit for lorries. 4,314,315, Cl. 362-80.000.
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Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,313,354, Cl. 74-869.000.
Oiry, Joel; and Imbach, Jean-Louis, to Agence Nationale de Valorisation de la Recherche (ANVAR). Cystamine derivatives suitable for use as medicaments. 4,314,076, Cl. 564-33.000.
Oizumi, Masayuki; Goto, Masana; Ishiki, Minoru; and Uozumi, Shoji, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Insulating laminates comprising alternating fiber reinforced resin layers and unreinforced resin layers. 4,314,002, Cl. 428-414.000.
Oka, Kimiaki: *See*—
Kakagawa, Kamuyuki; Uchida, Minoru; and Oka, Kimiaki, 4,313,947, Cl. 424-248.540.
Okado, Chihiro; Morishita, Takashi; and Hasegawa, Koki, to Tokyo Shibaura Denki Kabushiki Kaisha. Device for controlling the commutating angle of an inverter device. 4,314,189, Cl. 318-732.000.
Okajima, Shinpei, to Shimano Industrial Company Limited. Pedal for a bicycle. 4,313,352, Cl. 74-594.400.
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Takahashi, Masashi; and Okamoto, Atsuki, 4,313,770, Cl. 148-12.00C.
Okamura, Shigeru: *See*—
Tazaki, Shigemitsu; Okamura, Shigeru; and Kyogoku, Hiroshi, 4,313,684, Cl. 400-322.000.
Okubo, Shigeo. Flexural vibration sensor with magnetic field generating and sensing. 4,314,202, Cl. 324-207.000.
Okuda, Nobuo: *See*—
Shibayama, Shigeki; Iwata, Kazuhide; and Okuda, Nobuo, 4,314,333, Cl. 364-200.000.
Olin Corporation: *See*—
Brown, William D.; and Whitman, Hobart A., III, 4,314,142, Cl. 219-384.000.
Kircher, Morton S., 4,313,812, Cl. 204-253.000.
Oliver, Bernard M.: *See*—
Misson, William W.; Studley, Clarence K.; Oliver, Bernard M.; and Liljenwall, Edward T., 4,314,112, Cl. 200-5.00A.
Olofsson, Hans K., to Alfa-Laval AB. Milking plant. 4,313,396, Cl. 119-14.440.
Olsen, John H., to Flow Industries, Inc. High pressure cutting nozzle with on-off capability. 4,313,570, Cl. 239-583.000.
Olympus Optical Company Limited: *See*—
Nakajima, Yoshio; Takayama, Shuichi; Tsuboshima, Kosaku; Iwasawa, Teruo; and Yamazaki, Masafumi, 4,314,150, Cl. 250-201.000.
Suzuki, Takeomi; and Aoki, Masahiro, 4,314,151, Cl. 250-204.000.
Omodei-Sale, Amedeo: *See*—
Guzzi, Umberto; Omodei-Sale, Amedeo; and Galliani, Giulio, 4,313,950, Cl. 424-258.000.
Ondetti, Miguel A.; and Ryono, Denis E., to E. R. Squibb & Sons, Inc. Hypotensive imidazole substituted mercapto-1-oxopropyl-L-prolines. 4,313,948, Cl. 424-273.00R.
O'Neill, John F.: *See*—
Ruether, Peter G.; Vachon, Patrick A.; and O'Neill, John F., 4,314,100, Cl. 179-1.0SC.
O'Neill, John J., Jr.: *See*—
Benyon, Carl W., Jr.; and O'Neill, John J., Jr., 4,313,809, Cl. 204-192.00C.
Ono Pharmaceutical Co. Ltd.: *See*—
Wakatsuka, Hirohisa; Hayashi, Masaki; and Konishi, Yoshitaka, 4,313,954, Cl. 424-274.000.
Onoe, Morio. Radar reflector with variable electric reflectivity. 4,314,249, Cl. 343-18.00D.
Ootsuka, Yoshinori: *See*—
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,313,341, Cl. 73-862.330.
Ore, William C.: *See*—
Skoli, Sigmund P.; Ore, William C.; Kemp, David M.; and Mojonnier, Harry G., 4,313,370, Cl. 99-323.100.
Osborne, Edward L., to Westvaco Corporation. Produce container. 4,313,547, Cl. 220-416.000.
Osminin, Evgeny A.: *See*—
Gotovtseva, Ljubov A.; Konkova, Maia B.; Garbuz, Tatyana F.; Bunin, Oleg A.; Osminin, Evgeny A.; Zabavina, Nina A.; Ivanov, Alexei I.; Snopov, Vladimir P.; and Batkov, Alexandr I., 4,313,235, Cl. 8-149.100.
Osmose Wood Preserving Co. of America, Inc.: *See*—
Leach, Robert M., 4,313,976, Cl. 427-297.000.
Ostendorf, Hermann, to Deutsche Babcock Aktiengesellschaft. Steam generator. 4,313,398, Cl. 122-4.00D.
Ostkamp, Willi; and Paschedag, Theodor, to Westfalia Separator AG. Fully jacketed helical centrifuge. 4,313,559, Cl. 233-7.000.
Ostlie, L. David. Multiple angle single stage scrubber. 4,313,742, Cl. 55-241.000.
Otake, Mituyoshi: *See*—
Suzuki, Yoshihisa; Kaizuka, Takanoli; Hanyu, Yoshiaki; Otake, Mituyoshi; and Hidano, Yoichi, 4,313,989, Cl. 428-64.000.
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Niwa, Hitoshi; Miwa, Naoto; Suzuki, Masatoshi; and Ouki, Masami, 4,313,810, Cl. 204-195.00S.
Outboard Marine Corporation: *See*—
Hansen, Loren F.; and Stolley, Ronald M., 4,313,295, Cl. 56-15.800.
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Tuovinen, Frans H.; Honkala, Risto J.; and Metsarinta, Maija-Leena, 4,313,849, Cl. 252-421.000.
Owens-Corning Fiberglas Corporation: *See*—
Perkins, Richard A., 4,313,799, Cl. 204-1.00T.
Oyama, Tsutomu. Method for producing long-lasting analgesic effects of $\beta$-endorphin. 4,313,937, Cl. 424-177.000.
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DeLuca, Hector F.; Schnoes, Heinrich K.; Paaren, Herbert E.; and Frank, Helen, 4,313,942, Cl. 424-236.000.
Paitich, Ronald M.; and Briglia, Donald D. Method and means for vacuum gauging. 4,314,205, Cl. 324-460.000.
Pako Corporation: *See*—
Larson, Louis A.; and Euteneuer, Charles L., 4,313,669, Cl. 354-354.000.
Stewart, James F., 4,313,677, Cl. 355-76.000.
Panek, Peter; Gutsche, Walter; and Woditsch, Peter, to Bayer Aktiengesellschaft. Production of hydrolyzable titanyl sulphate solution. 4,313,913, Cl. 423-82.000.
Panich, Anatoly E.: *See*—
Fesenko, Evgeny G.; Dantsiger, Alla Y.; Filipiev, Viktor S.; Razumovskaya, Olga N.; Klevtsov, Alexandr N.; Lebedev, Vladimir N.; Grineva, Ljudmila D.; Rogach, Tatyana V.; Feronov,

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Paparizos, Christos: *See*—
Shaw, Wilfrid G.; Kuch, Philip L.; and Paparizos, Christos, 4,314,075, Cl. 562-599.000.

Paraskevopoulos, Demetris E.: *See*—
Fischbeck, Kenneth H.; Wright, Allen T.; Bain, Lee L.; and Paraskevopoulos, Demetris E., 4,314,282, Cl. 358-286.000.

Parazader, Stephen. Guideway units for elevated guideways. 4,313,383, Cl. 104-124.000.

Parekh, Bhupendra K.: *See*—
Goldberger, William M.; Epstein, Harold M.; and Parekh, Bhupendra K., 4,313,573, Cl. 241-1.000.

Parks, Richard E.: *See*—
Babb, Albert L.; and Parks, Richard E., 4,313,439, Cl. 128-214.00F.

Parlman, Robert M.; and Burns, Lyle D., to Phillips Petroleum Co. Substituted dihydro oxazines as hydrocarbon antioxidants. 4,313,738, Cl. 44-63.000.

Pasarela, Nunzio R., to American Cyanamid Company. Granular pesticidal compositions of decreased dermal toxicity and methods for preparing the same. 4,313,940, Cl. 424-215.000.

Paschedag, Theodor: *See*—
Ostkamp, Willi; and Paschedag, Theodor, 4,313,559, Cl. 233-7.000.

Patel, Kishor J., to Dynex/Rivett Inc. Servo valve. 4,313,468, Cl. 137-625.610.

Patent Development of N.C.: *See*—
Wood, George C., 4,313,572, Cl. 239-598.000.

Paterson, Malcolm M., to Raytheon Company. Multi-size materials separator. 4,313,543, Cl. 209-212.000.

Pathfinder Graphic Associates, Inc.: *See*—
Etchell, Gordon; and Frank, Cyril W., 4,313,378, Cl. 101-415.100.

Paulson, Gary R., to Hewlett-Packard Company. Spiral data cartridge carousel and positioning mechanism. 4,314,293, Cl. 360-92.000.

Paulus, Philippe A., to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Continuous heat-treatment process for steel strip. 4,313,772, Cl. 148-142.000.

Payer, Wolfgang: *See*—
Hobes, John-Victor; and Payer, Wolfgang, 4,314,035, Cl. 521-77.000.

Pearson, John, to Eaton-Leonard Corporation. Reversible bending machine. 4,313,324, Cl. 72-149.000.

Peerless of America, Inc.: *See*—
O'Connor, Joseph M., 4,313,327, Cl. 72-265.000.

Pelton, Robert H.; Allen, Lawrence H.; and Nugent, Henry M., to Pulp and Paper Research Institute of Canada. Additives for increased retention and pitch control in paper manufacture. 4,313,790, Cl. 162-163.000.

Penick, Ib: *See*—
Volkert, John K.; Penick, Ib; and Volkert, Robert B., 4,313,270, Cl. 40-124.100.

Penny, William A.; and Slater, Robert A. C., to City University, The; and Worshipful Company of Pewterers, The. Rotary forging machine. 4,313,332, Cl. 72-406.000.

Penrod, Bruce M.: *See*—
Fowler, Clarence W.; and Penrod, Bruce M., 4,314,378, Cl. 455-291.000.

Pereira, Munidas C.: *See*—
Zuber, Bretislav P.; and Pereira, Munidas C., 4,313,579, Cl. 242-163.000.

Perez, Raul E.: *See*—
Ledford, Thomas H.; and Perez, Raul E., 4,313,922, Cl. 423-578.00R.

Perkin-Elmer Corporation, The: *See*—
Pezzi, Louis D., 4,314,335, Cl. 364-200.000.

Perkins, Richard A., to Owens-Corning Fiberglas Corporation. Oxygen sensor and method for determining the oxygen activity in molten glass. 4,313,799, Cl. 204-1.00T.

Pesa, Frederick A.; and Haase, Thomas A., to Standard Oil Company. Carbonylation of olefinically unsaturated compounds. 4,313,893, Cl. 260-465.400.

Peters, Hartmut, to Hauni-Werke Korber & Co. KG. Rotary support for rolls of convoluted webs and means for damping its natural frequency oscillations. 4,313,577, Cl. 242-66.000.

Petersen, Clifford W.; Bednar, John M.; Hocker, Edwin J., Jr.; Gauger, David H.; and Henderson, James M., to Exxon Production Research Company; and Motorola, Inc. Acoustic transmitter and method to produce essentially longitudinal, acoustic waves. 4,314,365, Cl. 367-82.000.

Peterson, James J.; and Taylor, Glenn N., to Kendall Company, The. Collection bag. 4,313,447, Cl. 128-766.000.

Petrov, Vyacheslav V.; and Krjuchin, Andrei A. Radiation-sensitive material and method for recording information on radiation-sensitive material. 4,314,256, Cl. 346-1.100.

Petschke, Glenn H.: *See*—
Earing, Mason H.; Martin, Paul F.; and Petschke, Glenn H., 4,313,858, Cl. 260-18.0TN.

Pettibone Corporation: *See*—
Stepanek, Robert M., 4,313,575, Cl. 241-194.000.

Petzoldt, Jurgen: *See*—
Thomas, Friedrich W.; Sperzel, Wolfgang; and Petzoldt, Jurgen, 4,314,182, Cl. 315-307.000.

Pezzi, Louis D., to Perkin-Elmer Corporation, The. Multilevel priority arbiter. 4,314,335, Cl. 364-200.000.

Pfau, Jean; and Wavre, Alain, to Ateliers des Charmilles S.A. Process and apparatus for electrical discharge machining by means of a wire electrode. 4,314,133, Cl. 219-69.00M.

Pfleiderer, Hans-Joerg: *See*—
Knauer, Karl; and Pfleiderer, Hans-Joerg, 4,314,163, Cl. 307-221.00D.

Phelps, Clifford R. Well pump theft alarm. 4,314,243, Cl. 340-686.000.

Phelps Dodge Industries, Inc.: *See*—
Britner, George F.; and Zivic, John A., 4,313,430, Cl. 126-446.000.

Philion, Richard E.: *See*—
Lesher, George Y.; and Philion, Richard E., 4,313,951, Cl. 424-263.000.

Philip Morris Incorporated: *See*—
Nichols, Walter A.; and Mathe, George L., 4,313,339, Cl. 73-56.000.

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Cheng, Paul J., 4,313,921, Cl. 423-456.000.
Cooper, William T., 4,313,920, Cl. 423-449.000.
Farha, Floyd E., Jr.; and Gardner, Lloyd E., 4,313,820, Cl. 208-213.000.
Kallenberger, Robert H.; and Anderson, John E., 4,313,723, Cl. 432-37.000.
Parlman, Robert M.; and Burns, Lyle D., 4,313,738, Cl. 44-63.000.

Photowatt International, Inc.: *See*—
Chitre, Sanjeev R., 4,314,128, Cl. 219-10.55B.

Pichler, Marty A.: *See*—
Gaylor, V. Frances; Greene, Janice L.; Miller, Arthur F.; and Pichler, Marty A., 4,313,803, Cl. 204-74.000.

Pickel, Hajo, to ITT Industries, Inc. Brake shoe securing arrangement. 4,313,527, Cl. 188-73.320.

Pielsticker, Klaus P.: *See*—
Malinowski, Hans; and Pielsticker, Klaus P., 4,313,322, Cl. 72-164.000.

Pierburg Luftfahrtgerate Union GmbH: *See*—
Holzem, Heinz; and Kehrmann, Helmut, 4,313,465, Cl. 137-599.000.

Pierro, Joseph J.: *See*—
Darrow, John O. G.; and Pierro, Joseph J., 4,314,234, Cl. 340-825.360.

Pieters, Wim J. M.: *See*—
Sherwood, Rexford D.; Baker, Rees T. K.; Derouane, Eric G.; and Pieters, Wim J. M., 4,313,853, Cl. 252-445.000.

Pike, Daniel E., to Neptune AirPol, Inc. Process for removal of sulfur dioxide from gas streams. 4,313,924, Cl. 423-242.000.

Pilgram, Kurt H., to Shell Oil Company. N-Cyclopyopyl-N-(fluorophenyl)-N-acylureas and their herbidical use. 4,313,755, Cl. 71-120.000.

Pinternagel, Werner. Transistor amplifier. 4,314,207, Cl. 330-110.000.

Pioneer Electronic Corporation: *See*—
Kawasaki, Atsushi; and Munakata, Yukio, 4,314,229, Cl. 338-160.000.

Pitman, Donald G., to Mathews, Lester R. Fluid routing device. 4,313,455, Cl. 137-119.000.

Pitney Bowes Inc.: *See*—
Lowe, Lynnwood; and McFiggans, Robert B., 4,314,102, Cl. 179-2.00A.

Pittman, Earle S.: *See*—
Boratgis, James P.; and Pittman, Earle S., 4,313,308, Cl. 62-126.000.

Pittsburgh-Des Moines Corporation: *See*—
Cliff, John O., 4,313,457, Cl. 137-312.000.

Pivar, Stuart, to American Microcar, Inc. Lightweight electrically driven three-wheeled vehicle with low center of gravity and lightweight superstructure including improved braking system. 4,313,517, Cl. 180-216.000.

Pivot, Jean-Claude; and Aucagne, Jean, to Application Des Gaz. Textile element and woven material intended in particular to serve as substrate for a catalytic material, for instance a combustion catalytic material. 4,313,998, Cl. 428-222.000.

Planteline, Pierre, to Thomson-CSF. Shaft position sensor for an internal combustion engine equipped with an electronic ignition system. 4,313,414, Cl. 123-643.000.

Plantronics, Inc.: *See*—
Wilson, Donald R., 4,314,103, Cl. 179-6.110.

Plasko, Emil R., to Emerson Electric Company. Thermally actuatable electrical switch construction and method of making the same. 4,314,224, Cl. 337-408.000.

Plessey Handel und Investments AG: *See*—
Duncan, William C. W., 4,313,626, Cl. 285-86.000.

Plow, Robert J.; and Rader, Jerry C., to Reliance Electric Company. Three phase regulated supply with ripple current regulation. 4,314,322, Cl. 363-46.000.

Pneumo Corporation: *See*—
Blincoe, Richard A.; and Hrusch, Louis C., 4,313,364, Cl. 91-176.000.

Poeschl, Guenter, to Lamm, Helmut. Solar heated building. 4,313,420, Cl. 126-429.000.

Pogany, Stefano A.: *See*—
Bodor, Nicholas S.; Sloan, Kenneth B.; and Pogany, Stefano A., 4,313,956, Cl. 424-301.000.

Pointing, Roy A. W.; and Rucklidge, Richard A., to W. Darlington & Sons Limited. Mushroom growing. 4,313,278, Cl. 47-1.100.

Polaroid Corporation: *See*—
Finnemore, Fred M., 4,313,664, Cl. 354-288.000.
Gold, Nicholas, 4,313,667, Cl. 354-303.000.

Pontelin, Jaakko. Firewood chopper. 4,313,480, Cl. 144-193.00R.

Poppendiek, Heinz F., to United States of America, Energy. Method and apparatus for determining vertical heat flux of geothermal field. 4,313,342, Cl. 73-154.000.

Porter, Marion G.; Norman, Robert W., Jr.; and Ryan, Charles P., to Honeywell Information Systems Inc. Cache unit information replacement apparatus. 4,314,331, Cl. 364-200.000.

Porter, Ronald, to Grootcon (U.K.) Limited. Arc welding cupro nickel parts. 4,314,132, Cl. 219-61.000.

Posnikoff, Fred. Device for limiting lateral canting of road vehicles. 4,313,620, Cl. 280-718.000.

Postel, Michel; and Bouron, Jean-Pierre, to Thomson-CSF. Curve-generating device for visual display of symbols on a cathode-ray screen. 4,314,351, Cl. 364-720.000.

Pound, Joseph H., to American Fly Ash Company. Method of wasting fly ash and product produced thereby. 4,313,762, Cl. 106-85.000.

Povel, Rolf: *See—*
Luckel, Joachim; and Povel, Rolf, 4,313,365, Cl. 91-372.000.

Powell, Richard G.; and Smith, Cecil R., Jr., to United States of America, Agriculture. Chemotherapeutically active maytansinoids from *Trewia nudiflora*. 4,313,946, Cl. 424-248.540.

Powers, James C.: *See—*
Moran, Thomas F.; Powers, James C.; and Lively, Mark O., III, 4,313,911, Cl. 422-159.000.

PPG Industries, Inc.: *See—*
Girgis, Mikhail M., 4,314,050, Cl. 528-140.000.
Johnson, Harlan B.; and Chamberlin, Ronald D., 4,313,813, Cl. 204-263.000.
Sickles, James E.; and Chang, Wen-Hsuan, 4,313,968, Cl. 427-27.000.
Stoneberg, Richard L., 4,314,004, Cl. 428-421.000.
Yigdall, Jeffrey S., 4,313,722, Cl. 432-1.000.

Pradines, Eric C.: *See—*
Ciboit, Jacques J.; and Pradines, Eric C., 4,313,787, Cl. 159-48.00R.

Prasad, Keni K., to Deere & Company. Variable speed drive clutch. 4,313,728, Cl. 474-14.000.

Prasad, Ravi S.: *See—*
Schmitz, Francis J.; van der Helm, Dick; Hossain, M. Bilayet; Gopichand, Yalamanchili; and Prasad, Ravi S., 4,314,057, Cl. 542-401.000.

Préformed Line Products Co.: *See—*
Smith, Bert A., 4,314,094, Cl. 174-78.000.

Prestige Group Limited, The: *See—*
Jackson, Frederick P.; and Newell, Brian, 4,313,371, Cl. 99-337.000.

Pritchard, Dalton H.; and Schroeder, Alfred C., to RCA Corporation. Input-weighted transversal filter TV ghost eliminator. 4,314,277, Cl. 358-167.000.

Procter & Gamble Company, The: *See—*
Brown, James P.; and Laughlin, Robert G., 4,314,060, Cl. 544-171.000.
LaHann, Thomas R., 4,313,958, Cl. 424-324.000.

Produits Chimiques de la Montagne Noire: *See—*
Dabeaux, Michel; and Tyrtoff, Nikita, 4,313,915, Cl. 423-167.000.

Proffer, Charles L. Container cap with neck abutting retractable applicator. 4,313,686, Cl. 401-127.000.

Prohaska, Hans: *See—*
Gille, Gunther; Goertler, Horst; Prohaska, Hans; and Rachner, Horst, 4,314,186, Cl. 318-434.000.

Promeyrat, Maurice, to Societe Civile Promeyrat-Casteilla. Reciprocating piston. 4,313,368, Cl. 92-159.000.

Puch, Diethelm: *See—*
Lendl, Josef; and Puch, Diethelm, 4,313,681, Cl. 400-144.200.

Pulp and Paper Research Institute of Canada: *See—*
Pelton, Robert H.; Allen, Lawrence H.; and Nugent, Henry M., 4,313,790, Cl. 162-163.000.

Q-Dot, Inc.: *See—*
Gradl, David A., 4,314,212, Cl. 333-20.000.

Queneau, Paul B.: *See—*
Huggins, Dale K.; Queneau, Paul B.; and Beckstead, Leo W., 4,313,914, Cl. 423-58.000.

Quick-Rotan Elektromotoren GmbH: *See—*
Angersbach, Wolfgang; and Kling, Rudolf, 4,313,532, Cl. 192-113.00B.

R. Alkan & Cie: *See—*
Hasquenoph, Jean H.; and Coutin, Pierre F., 4,313,582, Cl. 244-137.00R.

R. Hagga & Soner Aktiebolag: *See—*
Sjostrand, Gunnar, 4,313,588, Cl. 248-524.000.

Raab, Frederick H., to Austin Company, The. Remote object position and orientation locater. 4,314,251, Cl. 343-112.00R.

Racal Group Services Limited: *See—*
Munday, Peter J., 4,314,208, Cl. 331-1.00A.

Rachner, Horst: *See—*
Gille, Gunther; Goertler, Horst; Prohaska, Hans; and Rachner, Horst, 4,314,186, Cl. 318-434.000.

Rader, Jerry C.: *See—*
Plow, Robert J.; and Rader, Jerry C., 4,314,322, Cl. 363-46.000.

Radlick, Phillip C., to Baxter Travenol Laboratories, Inc. Methods of synthesizing hexafluoroisopropanol from impure mixtures and synthesis of a fluoromethyl ether therefrom. 4,314,087, Cl. 568-842.000.

Rado, Theodore A., to Kerr-McGee Corporation. Process for recovering deashing solvent from insoluble coal products. 4,313,819, Cl. 208-177.000.

Ragaly, Istvar: *See—*
Heyke, Klaus; Schmidt, Gunter; and Ragaly, Istvar, 4,314,271, Cl. 357-76.000.

Raghu, Sivaraman; Hoffmann, Arthur K.; and Singh, Balwant, to American Cyanamid Co. Synthesis of tetramisole, levamisole and their derivatives. 4,314,066, Cl. 548-320.000.

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Ragle, Herbert U., to Burroughs Corporation. Di-bit recording technique and associated servo indicia. 4,314,290, Cl. 360-77.000.

Raines, Kenneth, to Burron Medical Inc. Additive cap and package therefor. 4,313,539, Cl. 206-461.000.

Ralph McKay Limited: *See—*
Young, Hartley F., 4,313,563, Cl. 238-349.000.

Ratigan, Brian J.; and Roop, Robert N., to Fischer & Porter Co. Enhanced disinfection system. 4,313,827, Cl. 210-136.000.

Rauhut, Michael M.: *See—*
Bollyky, Laszlo J.; and Rauhut, Michael M., 4,313,843, Cl. 252-188.3CL.

Raybould, Derek, to Institut Cerac S.A. Wear resistant aluminium alloy. 4,313,759, Cl. 75-249.000.

Raychem Corporation: *See—*
Cardinal, Raymond F.; and Walker, Jack M., 4,314,230, Cl. 338-314.000.
Horsma, David A., 4,314,145, Cl. 219-553.000.
Walty, Robert J., 4,314,231, Cl. 338-328.000.

Raytheon Company: *See—*
Paterson, Malcolm M., 4,313,543, Cl. 209-212.000.
Weiss, Bernard J., 4,314,127, Cl. 219-10.55F.

Razumovskaya, Olga N.: *See—*
Fesenko, Evgeny G.; Dantsiger, Alla Y.; Filipiev, Viktor S.; Razumovskaya, Olga N.; Klevtsov, Alexandr N.; Lebedev, Vladimir N.; Grineva, Ljudmila D.; Rogach, Tatyana V.; Feronov, Anatoly D.; Akbaeva, Galina M.; Cheptsov, Evgeny I.; Panich, Anatoly E.; Lisitsina, Ljudmila G.; Lavrikova, Svetlana A.; Ochirov, Vasily A.; Dudkina, Svetlana I.; Nevsky, Alexandr N.; Aleshin, Vladimir A.; Kupriyanov, Mikhail F.; Baljunis, Evgeny S.; Mordanov, Boris P.; Zhitomirsky, Grigory A.; Feldman, Naum B.; Smazhevskaya, Ekaterina G.; and Devlikanova, Ravilya U., 4,313,839, Cl. 252-62.900.

RCA Corporation: *See—*
Amery, John G., 4,314,273, Cl. 358-11.000.
Benyon, Carl W., Jr.; and O'Neill, John J., Jr., 4,313,809, Cl. 204-192.00C.
Bismarck, Otto H., 4,314,166, Cl. 307-475.000.
Pritchard, Dalton H.; and Schroeder, Alfred C., 4,314,277, Cl. 358-167.000.
Sokoloski, Joseph C., 4,313,782, Cl. 156-628.000.
Wheatley, Carl F., Jr., 4,313,971, Cl. 427-84.000.

RE-AL, Inc.: *See—*
Ditzig, Albert F., 4,314,117, Cl. 200-5.00A.

Read, Clifford D., to Northern Telecom Limited. Electric test equipment mounting. 4,314,309, Cl. 361-331.000.

Reaktor-Brennelement Union GmbH: *See—*
Sondermann, Thomas, 4,313,800, Cl. 204-1.500.

Rebucci, Eugene L.: *See—*
La Plante, Donald W.; Fairchild, Arthur; and Rebucci, Eugene L., 4,314,241, Cl. 340-603.000.

Reck, Richard A.: *See—*
Richmond, James M.; Reck, Richard A.; and Bernard, Gary A., 4,313,895, Cl. 260-501.150.

Recognition Equipment Incorporated: *See—*
Carr, William N., 4,314,348, Cl. 364-604.000.

Redaelli, Claudio, to Benomelli S.p.A. Extractive process for preparing apigenin. 4,313,880, Cl. 260-345.200.

Redcom Laboratories, Inc.: *See—*
Breidenstein, Charles J.; and Barbe, Charles A., III, 4,314,110, Cl. 179-175.20R.

Reed, Kenneth J.; Saturno, Patrick H.; and Ducharme, Gerald L., to Eastman Kodak Company. Color transfers assemblages with two timing layers and a neutralizing layer. 4,314,020, Cl. 430-215.000.

Reed, Paul A.: *See—*
Klaas, Jeffrey M.; Reed, Paul A.; and Rimawi, Isam, 4,314,362, Cl. 365-227.000.

Reichelderfer, Richard F.: *See—*
Davies, John T.; and Reichelderfer, Richard F., 4,313,783, Cl. 156-643.000.

Reilly, Charles M., to Xerox Corporation. Optical data recording medium. 4,314,262, Cl. 346-135.100.

Reinschutz, Hans. Set of paving elements for production of paving and method of using the same. 4,313,689, Cl. 404-73.000.

Reiter, Erich, to Berger, Johann; and Berger, Josef. Process and thread inserter for the manufacture of belting with tubular edge portions. 4,313,473, Cl. 139-432.000.

Reliable Electric Company: *See—*
Baumbach, Bertram W., 4,314,302, Cl. 361-119.000.
Baumbach, Bertram W., 4,314,304, Cl. 361-124.000.

Reliance Electric Company: *See—*
Plow, Robert J.; and Rader, Jerry C., 4,314,322, Cl. 363-46.000.

Renishaw Electrical Limited: *See—*
McMurtry, David R., 4,313,263, Cl. 33-174.00L.

Rennco Incorporated: *See—*
Swope, Jack G.; and Weiss, Harry C., 4,313,376, Cl. 101-27.000.

Renshaw, James T., to Monsanto Company. Plasticizers for vinyl chloride polymers. 4,313,866, Cl. 260-31.80H.

Repa Feinstanzwerk GmbH: *See—*
Fohl, Artur, 4,313,246, Cl. 24-230.0AT.

Resch, Reinhard, to Daimler-Benz Aktiengesellschaft. Brake force booster, especially for motor vehicles. 4,313,303, Cl. 60-556.000.

Research Corporation: *See*—
Bahl, Om P., 4,313,871, Cl. 260-112.00B.
Schmitz, Francis J.; van der Helm, Dick; Hossain, M. Bilayet; Gopichand, Yalamanchili; and Prasad, Ravi S., 4,314,057, Cl. 542-401.000.
Resistoflex Corporation: *See*—
Chu, Edward J., 4,313,901, Cl. 264-127.000.
Reymont, Bertrand, to Alfred Wertli Inc. Apparatus for guiding and supporting a continuously cast slab. 4,313,488, Cl. 164-448.000.
Rhone-Poulenc Agrochimie: *See*—
Abblard, Jean; and Lacroix, Guy, 4,313,957, Cl. 424-301.000.
Rhone-Poulenc Inc.: *See*—
Schreiber, Fred G.; and Gradeff, Peter S., 4,314,070, Cl. 560-64.000.
Rhone-Poulenc Industries: *See*—
Florent, Jean; Lunel, Jean; Mancy, Denise; and Vuillemin, Bernard, 4,313,936, Cl. 424-117.000.
Soula, Gerard; and Michelet, Daniel, 4,314,086, Cl. 568-652.000.
Rhone-Poulenc-Textile: *See*—
Claret, Jean P.; and Isoard, Bernard, 4,313,576, Cl. 242-18.0PW.
Ribka, Joachim: *See*—
Engelhardt, Friedrich; Hintermeier, Karl; Ribka, Joachim; Dursch, Walter; and Rupp, Walter, 4,314,052, Cl. 528-287.000.
Heinrich, Ernst; and Ribka, Joachim, 4,313,872, Cl. 260-152.000.
Ribout, Pierre: *See*—
Nazet, Rene; and Ribout, Pierre, 4,313,474, Cl. 140-71.00R.
Riccio, Pasquale R.; and Manning, George H., to MFE Corporation. Tape cassette holder. 4,314,294, Cl. 360-96.600.
Rich Products Corporation: *See*—
Kahn, Marvin L.; and Eapen, Kuttikandathil E., 4,313,967, Cl. 426-327.000.
Richard, Henry J.: *See*—
Gidge, Kenneth N.; and Richard, Henry J., 4,313,485, Cl. 160-328.000.
Richards, Colin M.: *See*—
Gillan, John; and Richards, Colin M., 4,314,033, Cl. 521-65.000.
Richards, Thomas E.; Harvey, James P.; and Daigle, Michael A., to Occidental Chemical Company. Process for removing fine solids from phosphoric acid by vacuum filtration. 4,313,919, Cl. 423-321.00R.
Richardson, Hubert, Jr., to Tecumseh Products Company. Anti-slug suction muffler for hermetic refrigeration compressor. 4,313,715, Cl. 417-312.000.
Richmond, James M.; Reck, Richard A.; and Bernard, Gary A., to Akzona Incorporated. Alkoxylated diquaternary ammonium compounds. 4,313,895, Cl. 260-501.150.
Richmond, Moscow K. Gate opening and closing apparatus and method. 4,313,281, Cl. 49-280.000.
Ricoh Co., Ltd.: *See*—
Hashimoto, Mitsuru; Sakai, Kiyoshi; Ohta, Masafumi; Kozima, Akio; Sasaki, Masaomi; and Tsutsui, Kyoji, 4,314,015, Cl. 430-58.000.
Namiki, Ryoichi, 4,313,981, Cl. 427-409.000.
Ohta, Masafumi; Hashimoto, Mitsuru; and Tsutsui, Kyoji, 4,314,016, Cl. 430-59.000.
Rieke, James K.: *See*—
Newman, Ritchey O.; Rieke, James K.; and Wright, Donald R., 4,313,996, Cl. 428-215.000.
Righele, Giovanni B.; and Scorzato, Giuseppe, to Risco Brevetti S.p.A. Rotary feed pump for a continuous machine for filling skins with mincemeat. 4,313,240, Cl. 17-37.000.
Rimawi, Isam: *See*—
Klaas, Jeffrey M.; Reed, Paul A.; and Rimawi, Isam, 4,314,362, Cl. 365-227.000.
Risco Brevetti S.p.A.: *See*—
Righele, Giovanni B.; and Scorzato, Giuseppe, 4,313,240, Cl. 17-37.000.
Ro-Ann Industries Corporation: *See*—
Rovigo, Luis, 4,313,781, Cl. 156-530.000.
Robert Bosch GmbH: *See*—
Heyke, Klaus; Schmidt, Gunter; and Ragaly, Istvar, 4,314,271, Cl. 357-76.000.
Severing, Joachim, 4,314,194, Cl. 322-89.000.
Roberts, George C., to Inca-One Corporation. Waterless flush toilet system. 4,313,233, Cl. 4-321.000.
Roberts, Harry H.; and Cote, Raymond A., to Champion International Corporation. Single-serving pie carton and blank. 4,313,542, Cl. 206-611.000.
Robertshaw Controls Company: *See*—
Bauer, Werner R.; and Smith, William N., 4,314,122, Cl. 200-72.00A.
Teichert, Allen L., 4,314,222, Cl. 337-107.000.
Robinson, Russell S. Resilient suspension means for light vehicles. 4,313,618, Cl. 280-688.000.
Robitaille, Dennis R.: *See*—
Vukasovich, Mark S.; and Robitaille, Dennis R., 4,313,837, Cl. 252-49.500.
Robson, Jerry A. Flashlight. 4,314,317, Cl. 362-189.000.
Rockwell International Corporation: *See*—
Burrus, Thomas W., 4,314,252, Cl. 343-113.00R.
Chung, Dong K., 4,313,794, Cl. 376-352.000.
Feight, Robert A., 4,313,567, Cl. 239-265.330.
Roper, Daniel W., 4,313,638, Cl. 297-374.000.
Rodac Pneumatic Tools: *See*—
Silvern, David H., 4,313,505, Cl. 173-93.500.
Rodden, M. Raymond. Speaker housing. 4,313,521, Cl. 181-145.000.
Rogach, Tatyana V.: *See*—
Fesenko, Evgeny G.; Dantsiger, Alla Y.; Filipiev, Viktor S.; Razumovskaya, Olga N.; Klevtsov, Alexandr N.; Lebedev, Vladimir N.; Grineva, Ljudmila D.; Rogach, Tatyana V.; Feronov, Anatoly D.; Akbaeva, Galina M.; Cheptsov, Evgeny I.; Panich, Anatoly E.; Lisitsina, Ljudmila G.; Lavrikova, Svetlana A.; Ochirov, Vasily A.; Dudkina, Svetlana I.; Nevsky, Alexandr N.; Aleshin, Vladimir A.; Kupriyanov, Mikhail F.; Baljunis, Evgeny S.; Mordanov, Boris P.; Zhitomirsky, Grigory A.; Feldman, Naum B.; Smazhevskaya, Ekaterina G.; and Devlikanova, Ravilya U., 4,313,839, Cl. 252-62.900.
Rogers Corporation: *See*—
Gordon, Herman B., 4,314,116, Cl. 200-5.00A.
Rogers, William E., to Solar Physics, Inc. Solar power source for a lighting system. 4,314,198, Cl. 323-351.000.
Rogov, Viktor F.; Nikiforov, Igor G.; Tatevosian, Ruben A.; Titov, Mikhail Y.; and Lipatov, Nikolai K. Apparatus for the activation of cement. 4,313,574, Cl. 241-78.000.
Rohde, Wolfgang: *See*—
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Rohm and Haas Company: *See*—
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Shimizu, Hiroshi; Daigo, Toshiyuki; and Azuma, Hideo, 4,313,832, Cl. 210-663.000.
Rohr Industries, Inc.: *See*—
Folmer, Carroll W.; and Hunter, Aldridge T., 4,313,581, Cl. 244-110.00B.
Rose, Philip M., 4,313,524, Cl. 181-291.000.
Rojahn, Willi: *See*—
Klein, Erich; and Rojahn, Willi, 4,313,855, Cl. 252-522.00R.
Rolls-Royce Limited: *See*—
Briggs, Henry R., 4,313,712, Cl. 416-2.000.
McMurtry, David R., 4,313,263, Cl. 33-174.00L.
Rombaut, Willy, to Gestinvest. Electric lighting installation. 4,314,238, Cl. 340-525.000.
Rome Industries, Inc.: *See*—
Coughran, Samuel J., Jr., 4,313,479, Cl. 144-3.00D.
Romeas, Rene: *See*—
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Romig, Byron A., Jr. Internally tensioned structural member and method of assembling same. 4,313,287, Cl. 52-223.00R.
Rooney, John O.: *See*—
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Roop, Robert N.: *See*—
Ratigan, Brian J.; and Roop, Robert N., 4,313,827, Cl. 210-136.000.
Roper, Daniel W., to Rockwell International Corporation. Infinitely variable seat recliner mechanism. 4,313,638, Cl. 297-374.000.
Rose, Joseph K. Adjustable light shield. 4,314,280, Cl. 358-255.000.
Rose, Levi L.: *See*—
Hestad, Alfred M.; Tentler, Michael; and Rose, Levi L., 4,314,107, Cl. 179-81.00R.
Rose, Philip M., to Rohr Industries, Inc. Bulk acoustic absorber panels for use in high speed gas flow environments. 4,313,524, Cl. 181-291.000.
Roussel Uclaf: *See*—
Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, 4,313,944, Cl. 424-248.400.
Rovigo, Luis, to Ro-Ann Industries Corporation. Method and apparatus for cutting and sealing thermoplastic material. 4,313,781, Cl. 156-530.000.
Rozanc, Richard C. Mine roof support plate bolt. 4,313,697, Cl. 405-261.000.
Rubens, Robert A. Convertible trash container carrier. 4,313,612, Cl. 280-79.10A.
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Jeffries, John A.; and Ruch, Mark H., 4,314,099, Cl. 179-1.00C.
Rucklidge, Richard A.: *See*—
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Ruderman, Alan: *See*—
Boyanich, Joseph E., 4,313,314, Cl. 62-324.100.
Ruether, Peter G.; Vachon, Patrick A.; and O'Neill, John F., to Storage Technology Corporation. Data detection circuit for a TASI system. 4,314,100, Cl. 179-1.0SC.
Ruf, Wolfgang; and Wagensonner, Eduard, to AGFA-Gevaert Aktiengesellschaft. System for utilizing a conventional n-bit successive approximation register to generate data words with more than n places. 4,314,235, Cl. 340-347.0AD.
Ruff, David L.; and Nath, Narikottile G., to Grefco, Inc. Perlite boards and method for making same. 4,313,997, Cl. 428-220.000.
Ruhrchemie Aktiengesellschaft: *See*—
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Runions, Sinville, to International Shoe Machine Corporation. Mechanism for performing work along an upwardly facing portion of a workpiece. 4,313,395, Cl. 118-411.000.
Rupp, Walter: *See*—
Engelhardt, Friedrich; Hintermeier, Karl; Ribka, Joachim; Dursch, Walter; and Rupp, Walter, 4,314,052, Cl. 528-287.000.
Rusu, John, to Electro-Magnetic Motors Inc. Magnetic motor. 4,314,169, Cl. 310-46.000.

Ryan, Charles P.: *See—*
Porter, Marion G.; Norman, Robert W., Jr.; and Ryan, Charles P., 4,314,331, Cl. 364-200.000.
Ryan, John O., to Ampex Corporation. Deflection coil driver apparatus. 4,314,184, Cl. 315-408.000.
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Barbuscio, Frank D.; Hunter, LeRoy; Hourihan, Joseph C.; Inglis, Mary C.; Oberstar, Helen E.; and Saad, Hosny, 4,313,393, Cl. 116-200.000.
Saalasti, Vaino T. Bark press. 4,313,375, Cl. 100-37.000.
Sado, Ryoichi; and Nei, Koichi, to Shin-Etsu Polymer Co., Ltd. Keyboard switching unit. 4,314,115, Cl. 200-5.00A.
Sahrbacker, Edward V., to Lucerne Products, Inc. Hand power tool control unit. 4,314,170, Cl. 310-68.00R.
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Saito, Masaaki: *See—*
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Saito, Shunjiro; Nakamura, Akio; and Kobayashi, Makoto, to TDK Electronics Co., Ltd. Electrode for electrolysis and manufacture thereof. 4,313,814, Cl. 204-290.00F.
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Saito, Syuichiro: *See—*
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Salisbury, Winfield W., to Occidental Research Corporation. High density ion source. 4,314,180, Cl. 376-130.000.
Salmon, Joe E. Auxilliary seed discharge for cotton gin roll box. 4,313,242, Cl. 19-55.00R.
Salonia, Joseph R.: *See—*
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Samochocka, Krystyna, to Uniwersytet Warszawski. Method for the preparation of a scintillographic agent. 4,313,926, Cl. 424-1.000.
Sander, Lars: *See—*
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Sanders, Thomas J.; and White, William H., to Harris Corporation. Method of fabricating improved radiation hardened self-aligned CMOS having Si doped Al field gate. 4,313,768, Cl. 148-1.500.
Sandford, Paul A.: *See—*
Baird, John K.; Sandford, Paul A.; and Shim, Jaewon L., 4,313,765, Cl. 106-197.00C.
Sandler, Louis M.; Spofford, Walter R.; and Scott, Charles E., to Emhart Industries, Inc. Alternating current power control circuit. 4,314,197, Cl. 323-324.000.
Sanford, Leon M.; and Tick, Paul A., to Corning Glass Works. Tin-phosphorus oxyfluoride glasses. 4,314,031, Cl. 501-44.000.
Sangamo Weston, Inc.: *See—*
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Sano, Shoichi: *See—*
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Santo, John E.: *See—*
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Sato, Akihiko: *See—*
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Sato, Hiroshi; Shigeta, Sadaaki; and Uchida, Hiroyuki, to Mitsubishi Rayon Company, Ltd. Inorganic ion exchanger. 4,313,844, Cl. 252-193.000.
Sato, Kanichi, to Hokkai Danro Yugen Kaisha. Method and apparatus for controlling a solid fuel burning furnace. 4,313,387, Cl. 110-192.000.
Sato, Moriichi: *See—*
Komatsuzaki, Shigeki; and Sato, Moriichi, 4,313,840, Cl. 252-78.500.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Ink supply device for hand labeler. 4,313,377, Cl. 101-295.000.
Sato, Yoshihiko; and Konishi, Tatsuo, to Nippon Electric Co., Ltd. Video head deflection apparatus for special motion reproduction by helical scan VTR. 4,314,284, Cl. 360-10.000.
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Tsuchiya, Takao; and Soneda, Mitsuo, 4,314,162, Cl. 307-221.00D.
Sony Corporation: *See*—
Tooyama, Akira; and Hosono, Takashi, 4,314,179, Cl. 315-12.0ND.
Tsuchiya, Takao; and Soneda, Mitsuo, 4,314,162, Cl. 307-221.00D.
Soo Hoo, Wayne J. Land vehicle. 4,313,511, Cl. 180-21.000.

Sorensen, Ejner V.: *See—*
Vangsted, Arne; and Sorensen, Ejner V., 4,314,141, Cl. 219-348.000.

Soula, Gerard; and Michelet, Daniel, to Rhone-Poulenc Industries. Preparation of aliphatic/aromatic ethers. 4,314,086, Cl. 568-652.000.

South African Inventions Development Corp.: *See—*
Madsen, Borge S., 4,313,348, Cl. 73-852.000.

Southgate, John P.: *See—*
Williams, Malcolm; Southgate, John P.; and Woodhouse, Richard G., 4,314,305, Cl. 361-154.000.

Sowade, Bernd: *See—*
Boden, Heinrich; Muller, Heinz; and Sowade, Bernd, 4,313,909, Cl. 422-133.000.

Sowerby, Brian D., to Australian Atomic Energy Commission. Method and apparatus for elemental analysis employing combination of neutron inelastic scattering and $\gamma$ ray scattering. 4,314,155, Cl. 250-253.000.

Spectra-Physics, Inc.: *See—*
Tomlinson, Barrett L., 4,314,343, Cl. 364-498.000.

Speigel, Alan B.; and Zurich, Robert P. Process of cleaning unwanted films. 4,313,841, Cl. 252-170.000.

Spencer Wright Industries, Inc.: *See—*
Biggs, Aubrey H.; Slattery, Ian; and Workman, Jack G., 4,313,388, Cl. 112-79.00R.

Sperry Corporation: *See—*
Kivela, Gary G., 4,314,341, Cl. 364-433.000.
Martenas, Wayne B., 4,313,294, Cl. 56-15.800.
Voigt, Henry K., 4,314,188, Cl. 318-721.000.

Sperzel, Wolfgang: *See—*
Thomas, Friedrich W.; Sperzel, Wolfgang; and Petzoldt, Jurgen, 4,314,182, Cl. 315-307.000.

Spiecens, Camil P.: *See—*
Stalemark, Ragnar F., 4,314,101, Cl. 179-2.00A.

Spiewok, Leonhard, to Escher Wyss Limited. Centrifuge screen. 4,313,992, Cl. 428-136.000.

Spitz, Jerold B. Method and apparatus for projector support. 4,313,665, Cl. 354-293.000.

Spofford, Walter R.: *See—*
Sandler, Louis M.; Spofford, Walter R.; and Scott, Charles E., 4,314,197, Cl. 323-324.000.

Sprow, Robert B.: *See—*
North, Steven F.; and Sprow, Robert B., 4,313,394, Cl. 118-323.000.

Spurr, Robert, to Emhart Industries, Inc. Parison transfer means. 4,313,720, Cl. 425-526.000.

Srdoch, Rudolph R., to Westinghouse Electric Corp. Mounting bracket for bracing peripheral connecting rings for dynamoelectric machines' stator windings. 4,314,173, Cl. 310-260.000.

SRI International: *See—*
Acton, Edward M.; and Mosher, Carol W., 4,314,054, Cl. 536-17.00A.

Staat, Karl-Hans; and Zacharias, Theodor, to Kocks Technik GmbH & Co. Push benches. 4,313,325, Cl. 72-208.000.

Stahl, Horst; and Wachs, Walter, to Siemens Aktiengesellschaft. Push-button switch, particularly for keyboards of typewriters and similar devices. 4,313,685, Cl. 400-479.000.

Stahr, Henry M., to Iowa State University Research Foundation, Inc. Method of detecting mold toxin infected grains. 4,314,027, Cl. 435-34.000.

Staker, William C.: *See—*
Lehnhoff, Richard N.; and Staker, William C., 4,313,402, Cl. 123-41.120.

Stalemark, Ragnar F., to Spiecens, Camil P. Remote supervising apparatus. 4,314,101, Cl. 179-2.00A.

Standard Oil Company, The: *See—*
Alford, Harvey E.; and Frazier, David, 4,313,835, Cl. 252-8.55D.
Gaylor, V. Frances; Greene, Janice L.; Miller, Arthur F.; and Pichler, Marty A., 4,313,803, Cl. 204-74.000.
Pesa, Frederick A.; and Haase, Thomas A., 4,313,893, Cl. 260-465.400.
Shaw, Wilfrid G.; Kuch, Philip L.; and Paparizos, Christos, 4,314,075, Cl. 562-599.000.

Standard Oil Company (Indiana): *See—*
Hanson, Robert B., 4,313,868, Cl. 260-37.00N.
Kildahl, Nicholas K.; and Fotis, Peter, 4,313,850, Cl. 252-429.00B.
Lin, Chi-Hung; and Leung, Linus K., 4,314,053, Cl. 528-483.000.
Martner, Samuel T.; and Arnold, Maurice E., Jr., 4,313,380, Cl. 181-116.000.
Throne, James L.; and Graves, Richard E., Jr., 4,314,036, Cl. 521-99.000.

Stanley, Priscilla B.: *See—*
Chu, Nan S.; Clinton, Nye A.; Cupper, Robert A.; Wolf, Philip F.; and Stanley, Priscilla B., 4,313,890, Cl. 260-410.600.

Steele, James R., to Dynamic Air Inc. Quick mount high pressure booster valves. 4,313,699, Cl. 406-93.000.

Stemme, Otto; and Wagensonner, Eduard, to Agfa-Gevaert AG. Electrooptic diaphragm and circuit operative for causing the diaphragm to open up stepwise and then close to terminate exposure. 4,313,663, Cl. 354-271.000.

Stepanek, Robert M., to Pettibone Corporation. Caps for hammermill rotors secured by individually-removable paired pin assemblies. 4,313,575, Cl. 241-194.000.

Stephan Pasek & Cie, Societe Anonyme: *See—*
Focant, Jean, 4,313,565, Cl. 239-132.300.

Stephen, John F.: *See—*
Kruse, Walter M.; and Stephen, John F., 4,314,078, Cl. 564-99.000.

Stephens, Geoffrey B.: *See—*
Bergeron, David L.; and Stephens, Geoffrey B., 4,314,267, Cl. 357-43.000.

Sterling Drug Inc.: *See—*
Lesher, George Y.; and Philion, Richard E., 4,313,951, Cl. 424-263.000.
Wesseler, Eugene P., 4,314,001, Cl. 428-393.000.

Sternberg, Moshe M.: *See—*
Kim, Chong Y.; and Sternberg, Moshe M., 4,313,962, Cl. 426-35.000.

Steven Manufacturing Company: *See—*
Klawitter, Ronald R., 4,313,277, Cl. 46-95.000.

Stevens, John; Huizinga, John S.; and Newman, Stephen, to Minnesota Mining and Manufacturing Company. Antistatic compositions and treatment. 4,313,978, Cl. 427-384.000.

Stewart, James F., to Pako Corporation. Neghold assembly for photographic printer. 4,313,677, Cl. 355-76.000.

Stewart, John M., to Santerra Industries Ltd. Toilet. 4,313,234, Cl. 4-449.000.

Steyr-Daimler-Puch Aktiengesellschaft: *See—*
Ledwinka, Erich; and Cvetnic, Milan, 4,313,518, Cl. 180-233.000.

Stier, Bernhard: *See—*
Mann, Arnold; and Stier, Bernhard, 4,313,515, Cl. 180-179.000.

Stiles, Jack L. Control system for environmental units. 4,313,560, Cl. 236-46.00R.

Stilwell, James H.: *See—*
Attwood, Stanley W.; and Stilwell, James H., 4,314,206, Cl. 329-50.000.

Stockman, Richard F., to Air Preheater Company, Inc., The. Turndown indicator for rotary regenerative heat exchanger. 4,313,489, Cl. 165-9.000.

Stokely, John E., to Texaco Inc. Seismic signal processing machine and method for noise removal. 4,314,347, Cl. 364-574.000.

Stokes, Kenneth B., to Medtronic, Inc. Myocardial sutureless lead. 4,313,448, Cl. 128-785.000.

Stokes, W. Fred; Bradford, Fairey S.; and Strobel, Nancy S. Competition game machine. 4,313,605, Cl. 273-85.00C.

Stoll, James W.: *See—*
Castro, Anthony J.; and Stoll, James W., 4,314,040, Cl. 525-6.000.

Stolley, Ronald M.: *See—*
Hansen, Loren F.; and Stolley, Ronald M., 4,313,295, Cl. 56-15.800.

Stoneberg, Richard L., to PPG Industries, Inc. Fluorocarbon resin coated substrates and methods of making. 4,314,004, Cl. 428-421.000.

Storage Technology Corporation: *See—*
Ruether, Peter G.; Vachon, Patrick A.; and O'Neill, John F., 4,314,100, Cl. 179-1.0SC.

Stout, David M., to American Hospital Supply Corporation. Derivatives of 2-amino-6,7-dihydroxytetrahydro naphthalene (ADTN). 4,314,082, Cl. 564-381.000.

Strobel, Nancy S.: *See—*
Stokes, W. Fred; Bradford, Fairey S.; and Strobel, Nancy S., 4,313,605, Cl. 273-85.00C.

Strow, Lawrence E.: *See—*
Fischer, Arthur H.; Strow, Lawrence E.; and Bolth, Franklin A., 4,313,838, Cl. 252-60.000.

"Studiecentrum voor Kernenergie," "S.C.K.": *See—*
de Mevergnies, Marcel N.; and Fettweis, Paul, 4,313,807, Cl. 204-157.10R.

Studley, Clarence K.: *See—*
Misson, William W.; Studley, Clarence K.; Oliver, Bernard M.; and Liljenwall, Edward T., 4,314,112, Cl. 200-5.00A.

Stuttard, Ivan, to Associated Electrical Industries Limited. Apparatus for the manufacture of mineral insulated cables. 4,313,247, Cl. 29-33.00F.

Suau, Jean; and Frawley, William, to Schlumberger Limited. Method of generating subsurface characteristic models. 4,314,338, Cl. 364-422.000.

Sudo, Tadamitsu: *See—*
Morita, Shiro; Sawai, Masanobu; Matsumoto, Shin-ichro; and Sudo, Tadamitsu, 4,313,929, Cl. 424-12.000.

Sugano, Kazuhiko: *See—*
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,313,354, Cl. 74-869.000.

Sugasawa, Fukashi: *See—*
Iizuka, Haruhiko; and Sugasawa, Fukashi, 4,313,406, Cl. 123-198.00F.

Sugatsune Industrial Co. Ltd.: *See—*
Tsuneki, Ken, 4,313,239, Cl. 16-236.000.

Suggitt, Robert M.: *See—*
Crone, John M., Jr.; and Suggitt, Robert M., 4,314,091, Cl. 585-486.000.

Sugita, Naoki: *See—*
Masuda, Senichi; and Sugita, Naoki, 4,313,741, Cl. 55-138.000.

Sugiura, Yoji; Date, Nobuaki; Suzuki, Ryoichi; and Saito, Syuichiro, to Canon Kabushiki Kaisha. Camera having electromagnetic drive source. 4,313,658, Cl. 354-152.000.

Sullivan, Alfred B.; and Wise, Raleigh W., to Monsanto Company. N-(Sulfenyl) phthalamides. 4,313,892, Cl. 260-453.0RW.

Sullivan, James P., to Marcy Gymnasium Equipment Co. Cycle-type exerciser. 4,313,602, Cl. 272-73.000.

Sumitomo Chemical Company, Limited: *See—*
Imai, Shozaburo; Suzuki, Haruo; Asai, Kuniaki; and Ueno, Katsuji, 4,313,870, Cl. 260-40.00R.

Sumitomo Electric Industries, Ltd.: *See—*
Toda, Yuichi, 4,313,744, Cl. 65-4.210.

Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See*—
Hashio, Moriki; and Kimura, Tomohiko, 4,313,487, Cl. 164-436.000.
Sumitomo Metal Industries, Ltd.: *See*—
Shibuya, Atsuyoshi; and Kurimoto, Tatsuo, 4,313,802, Cl. 204-28.000.
Takahashi, Masashi; and Okamoto, Atsuki, 4,313,770, Cl. 148-12.00C.
Sunahara, Kazuo; and Misumi, Akira, to Hitachi, Ltd. Oxide-coated cathode for electron tube. 4,313,854, Cl. 252-516.000.
Sundstrom, Hans-Gunnar. Book holder. 4,313,623, Cl. 281-15.00B.
Suyama, Tadakazu: *See*—
Arimura, Hirofumi; Nagai, Masanori; Yamauchi, Takeshi; Kitagawa, Tsutomu; and Suyama, Tadakazu, 4,313,938, Cl. 424-180.000.
Suzuki, Haruo: *See*—
Imai, Shozaburo; Suzuki, Haruo; Asai, Kuniaki; and Ueno, Katsuji, 4,313,870, Cl. 260-40.00R.
Suzuki, Ichiro; Ogawa, Hisashi; and Motonami, Masanao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Passive seatbelt system. 4,313,622, Cl. 280-804.000.
Suzuki, Masatoshi: *See*—
Niwa, Hitoshi; Miwa, Naoto; Suzuki, Masatoshi; and Ouki, Masami, 4,313,810, Cl. 204-195.00S.
Suzuki, Ryoichi: *See*—
Saito, Syuichiro; Suzuki, Ryoichi; and Uchiyama, Takashi, 4,313,659, Cl. 354-234.000.
Sugiura, Yoji; Date, Nobuaki; Suzuki, Ryoichi; and Saito, Syuichiro, 4,313,658, Cl. 354-152.000.
Suzuki, Sadao; Ichizawa, Yoshiyuki; and Seki, Nobuichi, to Yoshino Kogyosho Co., Ltd. Device for unloading bottle-shaped containers. 4,313,534, Cl. 198-484.000.
Suzuki, Takashi: *See*—
Nakamura, Etsumi; Suzuki, Takashi; Yanagida, Tadasu; and Yamamura, Minehiko, 4,313,875, Cl. 260-239.100.
Suzuki, Takeomi; and Aoki, Masahiro, to Olympus Optical Company Ltd. Focus detection by accumulation of a given number of the largest absolute difference magnitudes between adjacent photocells in an array. 4,314,151, Cl. 250-204.000.
Suzuki, Yoshihisa; Kaizuka, Takanoli; Hanyu, Yoshiaki; Otake, Mituyoshi; and Hidano, Yoichi, to Hitachi, Ltd. Magnetic recording medium. 4,313,989, Cl. 428-64.000.
Suzuki, Yukitomo, to Helan Iron Works, Ltd. Wood working router. 4,313,478, Cl. 144-1.00A.
Swaim, Robert J.: *See*—
Buckley, John D.; Swaim, Robert J.; and Fox, Robert L., 4,313,777, Cl. 156-272.000.
Swanson, Douglas: *See*—
Yeo, Norman H.; and Swanson, Douglas, 4,313,260, Cl. 29-792.000.
Swanson-Erie Corporation: *See*—
Yeo, Norman H.; and Swanson, Douglas, 4,313,260, Cl. 29-792.000.
Sweetheart Plastics, Inc.: *See*—
Brown, Gaylord W., 4,313,358, Cl. 83-97.000.
Swift, Graham: *See*—
Hughes, Kathleen A.; Kine, Benjamin B.; and Swift, Graham, 4,314,044, Cl. 260-29.60M.
Swiss Aluminium Ltd.: *See*—
Blanc, Jean M., 4,313,811, Cl. 204-243.00M.
Switzer, Robert D. Cartridge loader. 4,313,275, Cl. 42-89.000.
Swope, Jack G.; and Weiss, Harry C., to Rennco Incorporated. Imprinter. 4,313,376, Cl. 101-27.000.
Syntex (U.S.A.) Inc.: *See*—
Becker, Ronald K.; and Korb, Donald R., 4,313,355, Cl. 82-1.00C.
Syrier, Johannes L. M., to Shell Oil Company. 2-[2-(2,2-Dihalovinyl)-3,3-dimethylcyclopropyl]ethylidene diacetates. 4,314,072, Cl. 560-231.000.
Szucs, Stephen S., to American Cyanamid Company. Polysubstituted butanoic acids, esters and derivatives thereof utilizing the same as herbicides. 4,313,754, Cl. 71-94.000.
T. Y. Lin International: *See*—
Lin, Tung-Yen; Yang, Yue-Chyou; and Chow, Philip Y., 4,313,902, Cl. 264-228.000.
Tachikawa Spring Co., Ltd.: *See*—
Urai, Muneharu; Abe, Tadafumi; Haraguchi, Youichiro; and Hayashi, Koji, 4,313,776, Cl. 156-220.000.
Tadiran Israel Electronics Industries Ltd.: *See*—
Vardi, Isaih; Kimchi, Yigal; and Ben-Dror, Jonathan, 4,313,316, Cl. 62-475.000.
Tagliabue, Renato: *See*—
Molteni, Luigi; Tenconi, Franco; and Tagliabue, Renato, 4,313,943, Cl. 424-244.000.
Taguchi, Masahiko: *See*—
Uchida, Takashi; Sasaki, Takashi; Kikuchi, Shoji; Mogaki, Katsuo; Taguchi, Masahiko; and Takada, Syun, 4,314,011, Cl. 430-17.000.
Takada, Syun: *See*—
Uchida, Takashi; Sasaki, Takashi; Kikuchi, Shoji; Mogaki, Katsuo; Taguchi, Masahiko; and Takada, Syun, 4,314,011, Cl. 430-17.000.
Takahara, Sigeki: *See*—
Kobayashi, Kyoji; Kosaka, Takaichi; Takahara, Sigeki; and Tamura, Akira, 4,313,310, Cl. 62-175.000.
Takahashi, Fumio: *See*—
Miyaji, Yoshimori; Fujiki, Hirokazu; and Takahashi, Fumio, 4,314,272, Cl. 358-10.000.
Takahashi, Kenji: *See*—
Yano, Kensaku; and Takahashi, Kenji, 4,313,648, Cl. 350-166.000.
Takahashi, Masashi; and Okamoto, Atsuki, to Sumitomo Metal Industries, Ltd. Method of producing cold rolled steel strip having improved press formability and bake-hardenability. 4,313,770, Cl. 148-12.00C.
Takahashi, Nobuyoshi: *See*—
Ito, Toshio; Matsuoka, Hiromasa; Hirayama, Yoshio; and Takahashi, Nobuyoshi, 4,313,312, Cl. 62-271.000.
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Someya, Sinzo; and Sakashita, Nobuyuki, to Ishihara Sangyo Kaisha, Ltd. Herbicidal compound, herbicidal composition containing the same, and method of use thereof. 4,314,069, Cl. 560-62.000.
Takahashi, Tohru; Toyono, Tsutomu; Kanbe, Junichiro; Nakamura, Shunji; and Tamura, Yasuyuki, to Canon Kabushiki Kaisha. Developer without carrier powder having an improved triboelectric charging property. 4,314,017, Cl. 430-109.000.
Takahashi, Yoshiyuki: *See*—
Kobayashi, Isao; Akimoto, Hideo; Takahashi, Yoshiyuki; Hibiya, Tokio; and Hata, Masayuki, 4,313,343, Cl. 73-290.00V.
Takayama, Shuichi: *See*—
Nakajima, Yoshio; Takayama, Shuichi; Tsuboshima, Kosaku; Iwasawa, Teruo; and Yamazaki, Masafumi, 4,314,150, Cl. 250-201.000.
Takazawa, Eiichi, to Mamiya Koki Kabushiki Kaisha. Nonreflective coating. 4,313,647, Cl. 350-164.000.
Takeda Chemical Industries, Ltd.: *See*—
Goto, Jugo; and Doura, Fumihiro, 4,314,042, Cl. 525-59.000.
Takeda, Kuniharu, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Controller for lapping photography of cinecamera. 4,313,653, Cl. 352-91.00C.
Takeuchi, Masami: *See*—
Oguro, Takeshi; Mihara, Teruyoshi; Tominaga, Tamotsu; and Takeuchi, Masami, 4,314,226, Cl. 338-4.000.
Takouchi, Masao: *See*—
Kawase, Akira; Takouchi, Masao; Tsuji, Yoshio; Mitsumeri, Sadao; and Miyazaki, Susumu, 4,313,493, Cl. 165-122.000.
Talon, Inc.: *See*—
Authier, Charles A., 4,313,244, Cl. 24-205.13R.
Tam, Johann, to Silicon Valley Group, Inc., The. Method and apparatus for drying wafers. 4,313,266, Cl. 34-8.000.
Tamayo, Abel C. Insulator for foldable elements of dipole TV antennas. 4,314,254, Cl. 343-809.000.
Tamura, Akira: *See*—
Kobayashi, Kyoji; Kosaka, Takaichi; Takahara, Sigeki; and Tamura, Akira, 4,313,310, Cl. 62-175.000.
Tamura, Masayuki: *See*—
Kojima, Gen; Tamura, Masayuki; and Hisasue, Michio, 4,314,043, Cl. 525-102.000.
Tamura, Yasuyuki: *See*—
Takahashi, Tohru; Toyono, Tsutomu; Kanbe, Junichiro; Nakamura, Shunji; and Tamura, Yasuyuki, 4,314,017, Cl. 430-109.000.
Tanabe, Kozo: *See*—
Kitamura, Kumpei; Matsuki, Shigeru; and Tanabe, Kozo, 4,313,934, Cl. 424-85.000.
Tanabe Seiyaku Co., Ltd.: *See*—
Nakamura, Etsumi; Suzuki, Takashi; Yanagida, Tadasu; and Yamamura, Minehiko, 4,313,875, Cl. 260-239.100.
Tanaka, Junzo: *See*—
Yoshimura, Hirofumi; Tanaka, Junzo; and Ikeda, Nobuo, 4,314,126, Cl. 219-10.55R.
Taniguchi, Akio: *See*—
Yamamoto, Hideaki; Taniguchi, Akio; Horigome, Shinkichi; Saito, Susumu; Mori, Yoshiaki; and Maruyama, Eiichi, 4,314,014, Cl. 430-57.000.
Tanji, Shigeo; Wakatsuki, Noboru; and Tominaga, Hideki, to Fujitsu Limited. Surface acoustic wave filter device with equalization of stray coupling. 4,314,215, Cl. 333-193.000.
Tanno, Kiyohiko: *See*—
Tokunaga, Kazuyoshi; Anzai, Masayasu; Hoshi, Nobuyoshi; and Tanno, Kiyohiko, 4,314,257, Cl. 346-74.400.
Tashiro, Mamoru: *See*—
Idemoto, Noboru; Yamada, Minoru; Tashiro, Mamoru; and Matsushita, Sachio, 4,313,808, Cl. 204-180.00P.
Tassi, Lamberto; Tosarelli, Gianni; and Ballestrazzi, Aris, to Sitma - Societa Italiana Macchine Automatiche S.p.A. Machine for packaging various articles between two juxtaposed plastics material sheets. 4,313,288, Cl. 53-74.000.
Tatevosian, Ruben A.: *See*—
Rogov, Viktor F.; Nikiforov, Igor G.; Tatevosian, Ruben A.; Titov, Mikhail Y.; and Lipatov, Nikolai K., 4,313,574, Cl. 241-78.000.
Taylor, Glenn N.: *See*—
Peterson, James J.; and Taylor, Glenn N., 4,313,447, Cl. 128-766.000.
Tazaki, Shigemitsu; Okamura, Shigeru; and Kyogoku, Hiroshi, to Canon Kabushiki Kaisha. Recording apparatus. 4,313,684, Cl. 400-322.000.
TDK Electronics Co., Inc.: *See*—
Ishida, Toshihiko; and Satoh, Takateru, 4,314,299, Cl. 360-130.330.
TDK Electronics Co., Ltd.: *See*—
Saito, Shunjiro; Nakamura, Akio; and Kobayashi, Makoto, 4,313,814, Cl. 204-290.00F.
Satou, Hiroshi; and Yahagi, Tadao, 4,314,221, Cl. 336-83.000.
Teague, Edward W.; Graham, Louis A.; and McConnell, Bobby L., to Burlington Industries, Inc. Process for improving washfastness of indigo-dyed fabrics. 4,313,732, Cl. 8-541.000.
Tecumseh Products Company: *See*—
Richardson, Hubert, Jr., 4,313,715, Cl. 417-312.000.

Teichert, Allen L., to Robertshaw Controls Company. Thermostat anticipator improvements. 4,314,222, Cl. 337-107.000.
Teledyne Industries, Inc.: *See—*
Kotecki, Damian J., 4,314,136, Cl. 219-146.230.
Temple, Victor A. K., to Electric Power Research Institute, Inc. Thyristor with voltage breakover current control separated from main emitter by current limit region. 4,314,266, Cl. 357-38.000.
Tenconi, Franco: *See—*
Molteni, Luigi; Tenconi, Franco; and Tagliabue, Renato, 4,313,943, Cl. 424-244.000.
Tenmyo, Osamu: *See—*
Miyaki, Takeo; Tenmyo, Osamu; Konishi, Masataka; and Kawaguchi, Hiroshi, 4,314,028, Cl. 435-77.000.
Tenneco West, Inc.: *See—*
Tjerrild, William J., 4,313,374, Cl. 99-612.000.
Tentler, Michael: *See—*
Hestad, Alfred M.; Tentler, Michael; and Rose, Levi L., 4,314,107, Cl. 179-81.00R.
Teramoto, Toshio; Ijuin, Noriaki; and Kotani, Teizo, to Japan Synthetic Rubber Co., Ltd. Instant-setting adhesive composition. 4,313,865, Cl. 260-31.40R.
Terry, D. A. Automobile snow assembly. 4,313,516, Cl. 180-185.000.
Terry, John V.; Terry, Raymond M.; and Atkins, Ian A., to Terry, John Victor; and Terry, Raymond Michael. Adjustable lamps. 4,314,319, Cl. 362-287.000.
Terry, John Victor: *See—*
Terry, John V.; Terry, Raymond M.; and Atkins, Ian A., 4,314,319, Cl. 362-287.000.
Terry, Melvin D. Self regulating air bearing. 4,313,513, Cl. 180-124.000.
Terry, Raymond M.: *See—*
Terry, John V.; Terry, Raymond M.; and Atkins, Ian A., 4,314,319, Cl. 362-287.000.
Terry, Raymond Michael: *See—*
Terry, John V.; Terry, Raymond M.; and Atkins, Ian A., 4,314,319, Cl. 362-287.000.
Tesch, Allen R.: *See—*
Williams, Stanley A.; and Tesch, Allen R., 4,314,139, Cl. 219-285.000.
Texaco Inc.: *See—*
Crone, John M., Jr.; and Suggitt, Robert M., 4,314,091, Cl. 585-486.000.
Jones, Asberry B., 4,313,716, Cl. 417-331.000.
Stokely, John E., 4,314,347, Cl. 364-574.000.
Texas Instruments Incorporated: *See—*
Chapman, Richard A., 4,314,275, Cl. 358-113.000.
Jeffries, John A.; and Ruch, Mark H., 4,314,099, Cl. 179-1.00C.
Klaas, Jeffrey M.; Reed, Paul A.; and Rimawi, Isam, 4,314,362, Cl. 365-227.000.
McNeir, Ridge W.; and Head, Claude D., III, 4,314,342, Cl. 364-468.000.
Textron, Inc.: *See—*
Earing, Mason H.; Martin, Paul F.; and Petschke, Glenn H., 4,313,858, Cl. 260-18.0TN.
Theilen, Rolf, to Triumph-Adler Aktiengesellschaft fur Buround Informationstechnik. Final positioning vibration damping device for type disc typewriters. 4,313,682, Cl. 400-144.300.
Thiel, Klaus P.: *See—*
Briska, Marian; Metzger, Gert; and Thiel, Klaus P., 4,313,773, Cl. 148-188.000.
Thien, Gerhard: *See—*
Skatsche, Othmar; Fachbach, Heinz; Thien, Gerhard; Kirchweger, Karl; Greier, Josef; and List, Hans, 4,313,405, Cl. 123-195.00C.
Thigpen, Ben B.; and Hebert, Joel J., to Western Geophysical Company of America. Marine seismic cable handler. 4,314,363, Cl. 367-16.000.
Thir, Basil; Newkirk, David D.; Eisenstein, Stephen E.; and Langdon, William K., to BASF Wyandotte Corporation. Fiber lubricants yielding low residues upon oxidation. 4,314,000, Cl. 428-265.000.
Thomas, Friedrich W.; Sperzel, Wolfgang; and Petzoldt, Jurgen, to Leybold-Heraeus GmbH. System for controlling the power of a high-voltage electron beam generator. 4,314,182, Cl. 315-307.000.
Thomas, Mark W. Universal check valve assembly. 4,313,456, Cl. 137-269.000.
Thompson, Stanley C. Reinforced metal shell golf club head, with keel. 4,313,607, Cl. 273-167.00H.
Thomson-Brandt: *See—*
Caillet, Pierre; and Romeas, Rene, 4,314,369, Cl. 371-69.000.
Thomson-CSF: *See—*
Castera, Jean P.; Hartemann, Pierre; and Dupont, Jean M., 4,314,214, Cl. 333-141.000.
Cherier, Jacques; Dupressoir, Albert; and Aubergeon, Olivier, 4,314,246, Cl. 343-6.00R.
Heuze, Philippe; and Lambert, Pierre, 4,314,183, Cl. 315-389.000.
Llabres, Raymond; Antoine, Robert; Lacotte, Jean P.; and Marchi, Charles, 4,313,718, Cl. 425-290.000.
Maerfeld, Charles, 4,314,098, Cl. 179-1.0MF.
Nazet, Rene; and Ribout, Pierre, 4,313,474, Cl. 140-71.00R.
Planteline, Pierre, 4,313,414, Cl. 123-643.000.
Postel, Michel; and Bouron, Jean-Pierre, 4,314,351, Cl. 364-720.000.
Throne, James L.; and Graves, Richard E., Jr., to Standard Oil Company (Indiana). Unsaturated polyester resin foams and products containing the same. 4,314,036, Cl. 521-99.000.
Thyssen Industrie Aktiengesellschaft: *See—*
Schreckenberg, Klaus, 4,313,363, Cl. 89-46.000.
Tibbitt, James M.: *See—*
Berger, Mitchell H.; Matzner, Markus; and Tibbitt, James M., 4,314,051, Cl. 528-179.000.
Tick, Paul A.: *See—*
Sanford, Leon M.; and Tick, Paul A., 4,314,031, Cl. 501-44.000.
Tiliakos, Mike J. Portable lifting and delivering apparatus for bin containers. 4,313,708, Cl. 414-498.000.
Tilley, Jefferson W.: *See—*
Fahrenholtz, Kenneth E.; Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., 4,314,085, Cl. 568-644.000.
Timex Corporation: *See—*
Hsu, Ying Y., 4,313,878, Cl. 260-340.700.
Tin, Kam B.; and Norman, Stanley R. C., to GTE Automatic Electric Labs Inc. Computer channel access circuit for multiple input-output devices. 4,314,164, Cl. 307-243.000.
Tippetts, John R., to United Kingdom Atomic Energy Authority. Fluidic flow arrester. 4,313,470, Cl. 137-821.000.
Titov, Mikhail Y.: *See—*
Rogov, Viktor F.; Nikiforov, Igor G.; Tatevosian, Ruben A.; Titov, Mikhail Y.; and Lipatov, Nikolai K., 4,313,574, Cl. 241-78.000.
Tjerrild, William J., to Tenneco West, Inc. Machine for hulling nuts. 4,313,374, Cl. 99-612.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Ueno, Hiroshi; Imai, Masafumi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,314,046, Cl. 526-125.000.
Tobia, Enrico. Method of making a complete meal food product. 4,313,961, Cl. 426-19.000.
Toda, Yuichi, to Sumitomo Electric Industries, Ltd. Method and device for automatically fusing optical fibers. 4,313,744, Cl. 65-4.210.
Tokico Ltd.: *See—*
Kato, Tetuo; Uemura, Tamio; and Kodama, Yoshiki, 4,313,529, Cl. 188-299.000.
Tokunaga, Kazuyoshi; Anzai, Masayasu; Hoshi, Nobuyoshi; and Tanno, Kiyohiko, to Hitachi, Ltd. Thermomagnetic recording apparatus. 4,314,257, Cl. 346-74.400.
Tokutomi, Seijiro; Jyojiki, Masao; Nakamura, Kazuo; and Aoki, Harumi, to Asahi Kogaku Jogyo Kabushiki Kaisha. Display device for focus detecting and indicating device for camera. 4,313,657, Cl. 354-53.000.
Tokyo Automatic Machinery Works, Ltd.: *See—*
Furuya, Michio; and Sakamoto, Susumu, 4,313,290, Cl. 53-230.000.
Tokyo Gas Co. Ltd.: *See—*
Kawase, Akira; Takouchi, Masao; Tsuji, Yoshio; Mitsumeri, Sadao; and Miyazaki, Susumu, 4,313,493, Cl. 165-122.000.
Tokyo Sanyo Electric Co., Ltd.: *See—*
Kondo, Sadao; and Kishi, Hiroyasu, 4,314,377, Cl. 455-223.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Kondow, Ryotaro; and Inagaki, Junichi, 4,314,301, Cl. 361-65.000.
Miyaji, Yoshimori; Fujiki, Hirokazu; and Takahashi, Fumio, 4,314,272, Cl. 358-10.000.
Oda, Yasutaka; and Hamaoka, Hiromi, 4,314,291, Cl. 360-78.000.
Okado, Chihiro; Morishita, Takashi; and Hasegawa, Koki, 4,314,189, Cl. 318-732.000.
Shibayama, Shigeki; Iwata, Kazuhide; and Okuda, Nobuo, 4,314,333, Cl. 364-200.000.
Shiraogawa, Yukio; and Aoyagi, Keizo, 4,314,332, Cl. 364-200.000.
Yamaura, Mitsuru; and Yamakoshi, Yukinari, 4,314,199, Cl. 324-52.000.
Yano, Kensaku; and Takahashi, Kenji, 4,313,648, Cl. 350-166.000.
Tolliver, Daniel R.; and Haug, W. Gordon, to United States of America, Navy. Mooring system. 4,313,381, Cl. 102-413.000.
Tomatsuri, Masakazu: *See—*
Nakano, Yoshiyuki; Sato, Akihiko; and Tomatsuri, Masakazu, 4,313,660, Cl. 354-234.000.
Tominaga, Hideki: *See—*
Tanji, Shigeo; Wakatsuki, Noboru; and Tominaga, Hideki, 4,314,215, Cl. 333-193.000.
Tominaga, Tamotsu; and Mihara, Teruyoshi, to Nissan Motor Company, Ltd. Pressure sensor having semiconductor diaphragm. 4,314,225, Cl. 338-4.000.
Tominaga, Tamotsu: *See—*
Oguro, Takeshi; Mihara, Teruyoshi; Tominaga, Tamotsu; and Takeuchi, Masami, 4,314,226, Cl. 338-4.000.
Tomlinson, Barrett L., to Spectra-Physics, Inc. Method and apparatus for detecting and integrating chromatographic peaks. 4,314,343, Cl. 364-498.000.
Tomlinson, Harold W., Jr., to General Electric Company. Weighing scale with dynamic zero error correction. 4,313,510, Cl. 177-165.000.
Tooyama, Akira; and Hosono, Takashi, to Sony Corporation. Horizontal scanning rate correction apparatus. 4,314,179, Cl. 315-12.0ND.
Torikoshi, Seiko: *See—*
Hayami, Masaaki; and Torikoshi, Seiko, 4,314,058, Cl. 542-455.000.
Torok, Julius J. Mold with exterior heat conducting elements. 4,313,751, Cl. 65-267.000.
Torre, Douglas P. Liquified gas withdrawal apparatus. 4,313,306, Cl. 62-51.000.
Tosarelli, Gianni: *See—*
Tassi, Lamberto; Tosarelli, Gianni; and Ballestrazzi, Aris, 4,313,288, Cl. 53-74.000.
Touchette, Norman W.: *See—*
Joyce, Samuel F., III; Morgan, Albert W.; Touchette, Norman W.; and Vanderlinde, William, 4,313,761, Cl. 106-18.190.
Tourret, Jean: *See—*
Janssen, Sylvain; Tourret, Jean; Zarudiansky, Alain; and Allesch, Roland, 4,313,317, Cl. 62-514.00R.
Townsend, Todd V.: *See—*
Decoursey, Calvin H.; and Townsend, Todd V., 4,314,368, Cl. 370-108.000.

Toy, Wing N., to Bell Telephone Laboratories, Incorporated. Self-checking arithmetic unit. 4,314,350, Cl. 364-740.000.
Toyo Seikan Kaisha, Ltd.: *See—*
Miura, Hideo, 4,313,982, Cl. 427-428.000.
Toyono, Tsutomu: *See—*
Takahashi, Tohru; Toyono, Tsutomu; Kanbe, Junichiro; Nakamura, Shunji; and Tamura, Yasuyuki, 4,314,017, Cl. 430-109.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ito, Sadayoshi, 4,313,528, Cl. 188-218.00A.
Miyoshi, Takeo, 4,313,413, Cl. 123-549.000.
Muramatsu, Tadao; and Ichihashi, Yasuhiko, 4,313,617, Cl. 280-661.000.
Nishimura, Yuji; and Kubota, Tatsushi, 4,313,621, Cl. 280-804.000.
Suzuki, Ichiro; Ogawa, Hisashi; and Motonami, Masanao, 4,313,622, Cl. 280-804.000.
Tracor, Inc.: *See—*
Wallace, David W., 4,313,379, Cl. 102-217.000.
Tractor, Inc.: *See—*
Fowler, Clarence W.; and Penrod, Bruce M., 4,314,378, Cl. 455-291.000.
Tracy, David J.; Wood, Lindley S.; and Chakrabarti, Paritosh M., to GAF Corporation. Isocyanate polyoxyalkylenes. 4,313,764, Cl. 106-188.000.
Trak Incorporated: *See—*
Woitschatzke, Hans; and Geyer, Hennoch, 4,313,614, Cl. 280-610.000.
Transit Systems Technology, Inc.: *See—*
Gomez, Jim H.; and Davila, Jose E., 4,313,700, Cl. 406-156.000.
Transworld Drilling Company: *See—*
Cox, John W., 4,313,694, Cl. 405-168.000.
Tremblay, Michael A.: *See—*
Carau, Frank P., Sr.; Hetzel, Henry T.; and Tremblay, Michael A., 4,314,096, Cl. 178-19.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Process for hydrogenation of 2,6,6-trimethyl cyclohexene derivatves, products produced thereby and organoleptic uses of said products. 4,313,842, Cl. 252-174.110.
Trihey, John M., to Vulcan Australia Limited. Solar heating apparatus for swimming pools. 4,313,421, Cl. 126-415.000.
Triumph-Adler Aktiengesellschaft fur Buround Informationstechnik: *See—*
Theilen, Rolf, 4,313,682, Cl. 400-144.300.
Triumph-Werke Nurnberg A.G.: *See—*
Lendl, Josef; and Puch, Diethelm, 4,313,681, Cl. 400-144.200.
Tronc, Dominique, to CGR-MeV. Magnetic system for rearranging or regrouping charged particles within a pulsed beam. 4,314,218, Cl. 335-210.000.
Trotman, Helen H.; and Trotman, Herbert H. Covered body supporting and spacing structure and removable cover therefor. 4,313,640, Cl. 297-453.000.
Trotman, Herbert H.: *See—*
Trotman, Helen H.; and Trotman, Herbert H., 4,313,640, Cl. 297-453.000.
Tsai, Shirley C.; Graham, Richard H.; and Oder, Robin R., to Gulf Research & Development Company. Subterranean gasification of bituminous coal. 4,313,499, Cl. 166-248.000.
Tsuboshima, Kosaku: *See—*
Nakajima, Yoshio; Takayama, Shuichi; Tsuboshima, Kosaku; Iwasawa, Teruo; and Yamazaki, Masafumi, 4,314,150, Cl. 250-201.000.
Tsuchiya, Takao; and Soneda, Mitsuo, to Sony Corporation. Filter circuit utilizing charge transfer device. 4,314,162, Cl. 307-221.00D.
Tsuetaki, George F.: *See—*
Novicky, Nick N., 4,314,068, Cl. 556-440.000.
Tsuji, Yoshio: *See—*
Kawase, Akira; Takouchi, Masao; Tsuji, Yoshio; Mitsumeri, Sadao; and Miyazaki, Susumu, 4,313,493, Cl. 165-122.000.
Tsuneki, Ken, to Sugatsune Industrial Co. Ltd. Hinge mounting plate. 4,313,239, Cl. 16-236.000.
Tsunoda, Masakazu, to Nissan Motor Company, Limited. Voice warning system for an automotive vehicle. 4,314,232, Cl. 340-52.00F.
Tsuruta, Mitsuo; and Haga, Hachiro, to Nissan Motor Company Ltd. Painting plant and method for painting articles with reduced running cost. 4,313,369, Cl. 98-115.0SB.
Tsutsui, Kyoji: *See—*
Hashimoto, Mitsuru; Sakai, Kiyoshi; Ohta, Masafumi; Kozima, Akio; Sasaki, Masaomi; and Tsutsui, Kyoji, 4,314,015, Cl. 430-58.000.
Ohta, Masafumi; Hashimoto, Mitsuru; and Tsutsui, Kyoji, 4,314,016, Cl. 430-59.000.
Tsutsumi, Saburo: *See—*
Kunii, Kazuya; Tsutsumi, Saburo; and Ishizawa, Shizuo, 4,313,410, Cl. 123-432.000.
Tulin, Marshall P.; and Santo, John E., to Hydronautics, Incorporated. Method for increasing the cross-flow microfiltration fluxes of waste waters containing suspended solids and/or emulsified oil. 4,313,830, Cl. 210-639.000.
Tullos, Homan C.; and Woods, Dewey W., to Tullos & Woods Tools, Inc. Adjustable kelly bushing for downhole drilling system. 4,313,318, Cl. 64-23.600.
Tullos & Woods Tools, Inc.: *See—*
Tullos, Homan C.; and Woods, Dewey W., 4,313,318, Cl. 64-23.600.
Tuovinen, Frans H.; Honkala, Risto J.; and Metsarinta, Maija-Leena, to Outokumpu Oy. Process for the production of activated carbon from a moist organic substance. 4,313,849, Cl. 252-421.000.
Tupper, Alan W.; and Flux, Peter R., to Tupper, Alan William. Safety equipment for boats. 4,313,236, Cl. 9-14.000.
Tupper, Alan William: *See—*
Tupper, Alan W.; and Flux, Peter R., 4,313,236, Cl. 9-14.000.
Turner, Frederick T.: *See—*
Graves, Walter E., Jr.; Boys, Donald; and Turner, Frederick T., 4,313,815, Cl. 204-298.000.
Turpin, Raymond C., Jr. Cement compositions containing self-setting pozzolans. 4,313,763, Cl. 106-88.000.
Tuthill Corporation: *See—*
Antoniw, Walter W.; Silagy, Richard J.; and Norton, James F., 4,313,594, Cl. 251-357.000.
Twiefel, Gunter: *See—*
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Twin Disc, Incorporated: *See—*
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Tyrtoff, Nikita: *See—*
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Uchida, Hiroyuki: *See—*
Sato, Hiroshi; Shigeta, Sadaaki; and Uchida, Hiroyuki, 4,313,844, Cl. 252-193.000.
Uchida, Minoru: *See—*
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Uchida, Takashi; Sasaki, Takashi; Kikuchi, Shoji; Mogaki, Katsuo; Taguchi, Masahiko; and Takada, Syun, to Konishiroku Photo Industry Co., Ltd. Color photographic material. 4,314,011, Cl. 430-17.000.
Uchiyama, Haruo: *See—*
Minoura, Kazuo; Kiyohara, Takehiko; and Uchiyama, Haruo, 4,314,154, Cl. 250-235.000.
Uchiyama, Takashi: *See—*
Saito, Syuichiro; Suzuki, Ryoichi; and Uchiyama, Takashi, 4,313,659, Cl. 354-234.000.
Ueda, Hiroshi: *See—*
Matsui, Toru; Matsuda, Motonobu; Ueda, Hiroshi; Nanba, Yasuhiro; and Kuramoto, Yoshio, 4,313,654, Cl. 354-25.000.
Ueda, Hozumi: *See—*
Kawai, Yoichi; Sasagawa, Katsuyoshi; Maki, Masami; Ueda, Hozumi; and Miyamoto, Masayoshi, 4,314,039, Cl. 525-1.000.
Uemura, Tamio: *See—*
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Ueno, Hiroshi; Imai, Masafumi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for the stereoregular polymerization of α-olefins in the presence of a supported titanium catalyst. 4,314,046, Cl. 526-125.000.
Ueno, Katsuji: *See—*
Imai, Shozaburo; Suzuki, Haruo; Asai, Kuniaki; and Ueno, Katsuji, 4,313,870, Cl. 260-40.00R.
Ukawa, Naohiko: *See—*
Shiraishi, Yoshihiro; and Ukawa, Naohiko, 4,314,345, Cl. 364-500.000.
Umaba, Takayuki, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Magnetic recording or reproducing apparatus. 4,314,292, Cl. 360-86.000.
Umehara, Yozaburu. Tape guide apparatus. 4,313,551, Cl. 226-196.000.
Unie Van Kunstmestfabrieken, B.V.: *See—*
Hendriks, Petrus F. A. M.; Jansen, Arie; van den Berg, Willem B.; and Hoek, Cornelis, 4,313,918, Cl. 423-310.000.
Union Carbide Corporation: *See—*
Bassett, David R.; and Wang, Alan E., 4,313,861, Cl. 260-29.60H.
Berger, Mitchell H.; Matzner, Markus; and Tibbitt, James M., 4,314,051, Cl. 528-179.000.
Chu, Nan S.; Clinton, Nye A.; Cupper, Robert A.; Wolf, Philip F.; and Stanley, Priscilla B., 4,313,890, Cl. 260-410.600.
Curnow, Richard D.; and Cowie, Christopher G., 4,314,003, Cl. 428-294.000.
Gardner, Hugh C., 4,313,859, Cl. 260-18.0PF.
Henning, William A.; and Linebarger, Henry F., 4,313,758, Cl. 75-130.00R.
Jones, Robert A., Jr.; Marcinkowsky, Arthur E.; and Keller, George E., II, 4,313,916, Cl. 423-226.000.
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Kiyonoga, Kazuo, 4,313,757, Cl. 75-3.000.
Louzos, Demetrios V., 4,314,010, Cl. 429-191.000.
United Kingdom Atomic Energy Authority: *See—*
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United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Shillam, Norman F., 4,313,346, Cl. 73-517.00R.
United Networks, Inc.: *See—*
Hestad, Alfred M.; Tentler, Michael; and Rose, Levi L., 4,314,107, Cl. 179-81.00R.
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Agriculture: *See—*
Powell, Richard G.; and Smith, Cecil R., Jr., 4,313,946, Cl. 424-248.540.
Air Force: *See—*
Wolff, Ernest G.; and Eselun, Steven A., 4,313,679, Cl. 356-244.000.
Army: *See—*
Miller, Walter E., Jr., 4,313,651, Cl. 350-355.000.
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Bamberger, Carlos E., 4,313,925, Cl. 423-263.000.
Cowan, Richard G.; and Blasewitz, Albert G., 4,313,845, Cl. 252-630.000.
Hunt, Arlon J., 4,313,304, Cl. 60-641.800.
Johnson, James S., Jr.; and Westmoreland, Clyde G., 4,313,500, Cl. 166-273.000.
Kaun, Thomas D.; and Eshman, Paul F., 4,313,259, Cl. 29-623.200.
Poppendiek, Heinz F., 4,313,342, Cl. 73-154.000.
Schreyer, James M.; and Dorsey, George F., 4,313,424, Cl. 126-433.000.
Health, Education and Welfare: *See—*
Kanatani, Frank N., 4,313,446, Cl. 128-744.000.
Interior: *See—*
Colvocoresses, Alden P., 4,313,678, Cl. 356-2.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Kendall, James M., Jr. Method of forming frozen spheres in a force-free drop tower. 4,313,745, Cl. 65-21.400.
Lund, Gordon F. Pocket ECG electrode. 4,313,443, Cl. 128-642.000.
National Aeronautics and Space Administration: *See—*
Buckley, John D.; Swaim, Robert J.; and Fox, Robert L., 4,313,777, Cl. 156-272.000.
Chase, Wendell D., 4,313,726, Cl. 434-42.000.
Crowell, Russell T., 4,313,291, Cl. 53-429.000.
Navy: *See—*
Neal, Jesse R., Jr.; and Bleile, Henry R., 4,313,860, Cl. 260-27.00R.
Sivahop, Albert; Adams, Don L., Sr.; and Fischer, William C., 4,314,307, Cl. 361-194.000.
Tolliver, Daniel R.; and Haug, W. Gordon, 4,313,381, Cl. 102-413.000.
White, Jerome V., 4,314,248, Cl. 343-18.00E.
U.S. Philips Corporation: *See—*
Bakker, Pieter, 4,314,106, Cl. 179-16.00F.
Calderoni, Gabriele; and Gavina, Gian A., 4,313,315, Cl. 62-475.000.
Groves, Peter H.; and Hilbourne, Robert A., 4,314,167, Cl. 307-540.000.
Jacobs, Cornelis A. J.; Schellen, Johannes A. T.; and Kuus, Gijsbert, 4,314,175, Cl. 313-174.000.
Jansen, Pierre G.; Kessels, Jozef L. W.; and Waumans, Benny L. A., 4,314,361, Cl. 365-221.000.
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Notelteirs, Victor R., 4,314,176, Cl. 313-185.000.
Van de Grift, Robert E. J., 4,314,326, Cl. 363-127.000.
Van Gorp, Cornelis J., 4,313,550, Cl. 226-194.000.
United Technologies Corporation: *See—*
Goller, Glen J.; and Salonia, Joseph R., 4,313,972, Cl. 427-113.000.
Uniwersytet Warszawski: *See—*
Samochocka, Krystyna, 4,313,926, Cl. 424-1.000.
UOP Inc.: *See—*
Arena, Blaise J., 4,313,884, Cl. 260-345.90R.
Barley, Geoffrey W., 4,313,637, Cl. 297-284.000.
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Upjohn Company, The: *See—*
Bundy, Gordon L., 4,313,877, Cl. 260-333.000.
Gammill, Ronald B., 4,313,881, Cl. 260-345.200.
Gammill, Ronald B., 4,313,882, Cl. 260-345.200.
Gammill, Ronald B., 4,313,883, Cl. 260-345.200.
Ura, Hiroaki; and Honda, Hiroyuki, to Konishiroku Photo Industry Co., Ltd. Cleaning apparatus for copying or the like. 4,313,674, Cl. 355-15.000.
Urai, Muneharu; Abe, Tadafumi; Haraguchi, Youichiro; and Hayashi, Koji, to Tachikawa Spring Co., Ltd. Method of producing seat cushion member. 4,313,776, Cl. 156-220.000.
Vachon, Patrick A.: *See—*
Ruether, Peter G.; Vachon, Patrick A.; and O'Neill, John F., 4,314,100, Cl. 179-1.0SC.
Valence, Georges: *See—*
Cases, Jean M.; Valence, Georges; and Lietard, Olivier, 4,313,822, Cl. 209-233.000.
Van de Grift, Robert E. J., to U.S. Philips Corporation. Rectifying circuit with zero correction. 4,314,326, Cl. 363-127.000.
van den Berg, Willem B.: *See—*
Hendriks, Petrus F. A. M.; Jansen, Arie; van den Berg, Willem B.; and Hoek, Cornelis, 4,313,918, Cl. 423-310.000.
van der Helm, Dick: *See—*
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Vanderlinde, William: *See—*
Joyce, Samuel F., III; Morgan, Albert W.; Touchette, Norman W.; and Vanderlinde, William, 4,313,761, Cl. 106-18.190.
Van Gorp, Cornelis J., to U.S. Philips Corporation. Package containing optical fibres made of glass and apparatus for packing glass optical fibres. 4,313,550, Cl. 226-194.000.
Vangsted, Arne; and Sorensen, Ejner V., to Lip Bygningsartikler A/S. Apparatus for heat shrinking a plastic film around goods stacked on a pallet. 4,314,141, Cl. 219-348.000.
Van Meenen, Pierre, to Societe Anonyme Fileca. Taping installation. 4,313,298, Cl. 57-3.000.
van Rumpt, Jacob; and Vorstenbosch, Martinus T., to Amko B.V. Feeding machine for sheets. 4,313,269, Cl. 38-143.000.
Van Vloten, Curtis P.: *See—*
Cairns, Walter J.; and Van Vloten, Curtis P., 4,314,259, Cl. 346-75.000.
Van Wilson, Marlin; Nickell, Lawrence C.; and Nickell, Larry C., to Appalachian Electronic Instruments, Inc. Yarn tension control apparatus. 4,313,578, Cl. 242-149.000.
Vardi, Isaih; Kimchi, Yigal; and Ben-Dror, Jonathan, to Tadiran Israel Electronics Industries Ltd. Condenser purge system. 4,313,316, Cl. 62-475.000.
Varian Associates, Inc.: *See—*
Graves, Walter E., Jr.; Boys, Donald; and Turner, Frederick T., 4,313,815, Cl. 204-298.000.
VBC, Inc.: *See—*
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Ohkita, Masao; and Yamashita, Hitoshi, 4,314,118, Cl. 200-16.00F.

Yamashita, Katsuji; and Nomura, Yasushi, to Hitachi, Ltd. Automatic chemical analyzing method and apparatus. 4,313,735, Cl. 23-230.00R.

Yamashita, Michio: *See*—
Komori, Tadaaki; Yamashita, Michio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,313,935, Cl. 424-115.000.
Yamashita-Shinnihon Steamship Co., Ltd.: *See*—
Yunoki, Shigeto; and Makizono, Masataka, 4,313,390, Cl. 114-74.00R.
Yamauchi, Takeshi: *See*—
Arimura, Hirofumi; Nagai, Masanori; Yamauchi, Takeshi; Kitagawa, Tsutomu; and Suyama, Tadakazu, 4,313,938, Cl. 424-180.000.
Yamaura, Mitsuru; and Yamakoshi, Yukinari, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for locating a fault point on a transmission line. 4,314,199, Cl. 324-52.000.
Yamazaki, Ikue. Acidic two-bath type composition for permanent waving of hair and for treatment of hair and scalp. 4,313,933, Cl. 424-72.000.
Yamazaki, Masafumi: *See*—
Nakajima, Yoshio; Takayama, Shuichi; Tsuboshima, Kosaku; Iwasawa, Teruo; and Yamazaki, Masafumi, 4,314,150, Cl. 250-201.000.
Yanagida, Tadasu: *See*—
Nakamura, Etsumi; Suzuki, Takashi; Yanagida, Tadasu; and Yamamura, Minehiko, 4,313,875, Cl. 260-239.100.
Yang, Yue-Chyou: *See*—
Lin, Tung-Yen; Yang, Yue-Chyou; and Chow, Philip Y., 4,313,902, Cl. 264-228.000.
Yano, Kensaku; and Takahashi, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. Patterned multi-layer structure and manufacturing method. 4,313,648, Cl. 350-166.000.
Yargici, Zekeriya, to American Hoist & Derrick Company. Lubrication and bearing structure for concentric, independently rotating drum and vibratory shaft. 4,313,691, Cl. 404-117.000.
Yasuda, Shinichiro, to Kao Soap Co., Ltd. Polyester resin composition. 4,314,049, Cl. 528-128.000.
Yeo, Norman H.; and Swanson, Douglas, to Swanson-Erie Corporation. Assembly machine. 4,313,260, Cl. 29-792.000.
Yigdall, Jeffrey S., to PPG Industries, Inc. Fluid shielded burner tip for use with a glass melting furnace. 4,313,722, Cl. 432-1.000.
Yoda, Makoto: *See*—
Ueno, Hiroshi; Imai, Masafumi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,314,046, Cl. 526-125.000.
Yokomichi, Isao: *See*—
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Someya, Sinzo; and Sakashita, Nobuyuki, 4,314,069, Cl. 560-62.000.
Yoshida, Hajime, to Hajime Industries, Ltd. Matrix array camera. 4,314,279, Cl. 358-212.000.
Yoshida Kogyo, K.K.: *See*—
Yamaguchi, Yoshiharu, 4,313,245, Cl. 24-205.16R.
Yoshida, Norimasa: *See*—
Handa, Ryoji; Yoshida, Norimasa; Hosoda, Jun; and Furuno, Akihisa, 4,313,863, Cl. 260-29.60E.
Yoshida, Tsuyoshi: *See*—
Miki, Nobuaki; Kawamoto, Mutsumi; Amano, Hiroyuki; Hida, Tsuneo; and Yoshida, Tsuyoshi, 4,314,340, Cl. 364-424.100.
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pharmaceutical composition containing para-aminobenzoic acid-N-L-rhamnoside as an active ingredient. 4,313,939, Cl. 424-180.000.
Yoshimura, Hirofumi; Tanaka, Junzo; and Ikeda, Nobuo, to Matsushita Electric Industrial Co., Ltd. Microwave heating apparatus with cooling conduit. 4,314,126, Cl. 219-10.55R.
Yoshimura, Kazunori: *See*—
Ito, Katsuo; and Yoshimura, Kazunori, 4,314,220, Cl. 336-65.000.
Yoshino Kogyosho Co., Ltd.: *See*—
Suzuki, Sadao; Ichizawa, Yoshiyuki; and Seki, Nobuichi, 4,313,534, Cl. 198-484.000.
Yoshioka, Takakazu; and Kurozumi, Masayuki, to Nippon Electric Co., Ltd. Integrated circuit with shielded lead patterns. 4,314,268, Cl. 357-48.000.
Young, Hartley F., to Ralph McKay Limited. Rail fastener. 4,313,563, Cl. 238-349.000.
Yunoki, Shigeto; and Makizono, Masataka, to Yamashita-Shinnihon Steamship Co., Ltd. Tanker construction. 4,313,390, Cl. 114-74.00R.
Zabavina, Nina A.: *See*—
Gotovtseva, Ljubov A.; Konkova, Maia B.; Garbuz, Tatyana F.; Bunin, Oleg A.; Osminin, Evgeny A.; Zabavina, Nina A.; Ivanov, Alexei I.; Snopov, Vladimir P.; and Batkov, Alexandr I., 4,313,235, Cl. 8-149.100.
Zacharias, Theodor: *See*—
Staat, Karl-Hans; and Zacharias, Theodor, 4,313,325, Cl. 72-208.000.
Zahnradfabrik Friedrichshafen, AG.: *See*—
Lang, Armin, 4,313,467, Cl. 137-625.300.
Zardi, Umberto; and Lagana', Vincenzo, to Snamprogetti S.p.A. Method for the production of urea and purification of water. 4,314,077, Cl. 564-70.000.
Zarudiansky, Alain: *See*—
Janssen, Sylvain; Tourret, Jean; Zarudiansky, Alain; and Allesch, Roland, 4,313,317, Cl. 62-514.00R.
Zaucha, Thomas J.: *See*—
Chasin, David G.; and Zaucha, Thomas J., 4,313,847, Cl. 252-356.000.
Zengel, Hans; Bergfeld, Manfred; and Klostermeier, Werner, to Akzona Incorporated. Process for the preparation of nitrosobenzene. 4,314,089, Cl. 568-949.000.
Zhitomirsky, Grigory A.: *See*—
Fesenko, Evgeny G.; Dantsiger, Alla Y.; Filipiev, Viktor S.; Razumovskaya, Olga N.; Klevtsov, Alexandr N.; Lebedev, Vladimir N.; Grineva, Ljudmila D.; Rogach, Tatyana V.; Feronov, Anatoly D.; Akbaeva, Galina M.; Cheptsov, Evgeny I.; Panich, Anatoly E.; Lisitsina, Ljudmila G.; Lavrikova, Svetlana A.; Ochirov, Vasily A.; Dudkina, Svetlana I.; Nevsky, Alexandr N.; Aleshin, Vladimir A.; Kupriyanov, Mikhail F.; Baljunis, Evgeny S.; Mordanov, Boris P.; Zhitomirsky, Grigory A.; Feldman, Naum B.; Smazhevskaya, Ekaterina G.; and Devlikanova, Raviya U., 4,313,839, Cl. 252-62.900.
Zierden Company: *See*—
Zierden, Frank P.; and Zierden, Peter F., 4,313,624, Cl. 285-14.000.
Zierden, Frank P.; and Zierden, Peter F., to Zierden Company. Swivel cartridge. 4,313,624, Cl. 285-14.000.
Zierden, Peter F.: *See*—
Zierden, Frank P.; and Zierden, Peter F., 4,313,624, Cl. 285-14.000.
Zinser Textilmaschinen Gesellschaft mit beschrankter Haftung: *See*—
Gunkinger, Siegfried; Weeger, Hans-Peter; Kriechbaum, Kurt; and Igel, Wolfgang, 4,313,299, Cl. 57-267.000.
Zivic, John A.: *See*—
Britner, George F.; and Zivic, John A., 4,313,430, Cl. 126-446.000.
Zuber, Bretislav P.; and Pereira, Munidas C., to Northern Telecom Limited. Twistless payout package of filamentary material. 4,313,579, Cl. 242-163.000.
Zurbuchen, Jacques; Lauton, Alain; and Luttringer, Jean P., to Ciba-Geigy Corporation. Assistant mixture for the dyeing or fluorescent brightening. 4,313,733, Cl. 8-582.000.
Zurich, Robert P.: *See*—
Speigel, Alan B.; and Zurich, Robert P., 4,313,841, Cl. 252-170.000.

# LIST OF REISSUE PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 2ND DAY OF FEBRUARY, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Cotton, Incorporated: *See*—
Swidler, Ronald; and Wilson, Katherine W., Re. 30,860, Cl. 8-116.400.

Ford, Eric H., to Lumenition Limited. Ignition systems for internal combustion engines. Re. 30,858, Cl. 123-651.000.

Greigg, Edwin E.: *See*—
Tyler, Tracy B., Re. 30,857, Cl. 30-43.500.

Harvey, Leslie E.; and Spiva, Stephan D. Bowling practice device. Re. 30,859, Cl. 273-54.00D.

Lumenition Limited: *See*—
Ford, Eric H., Re. 30,858, Cl. 123-651.000.

Spiva, Stephan D.: *See*—
Harvey, Leslie E.; and Spiva, Stephan D., Re. 30,859, Cl. 273-54.00D.

Swidler, Ronald; and Wilson, Katherine W., to Cotton, Incorporated. Process for treating cellulosic material with formaldehyde in liquid phase and sulfur dioxide. Re. 30,860, Cl. 8-116.400.

Tyler, Tracy B., to Greigg, Edwin E., a part interest. Rotary dry shaver with tiltable shear plates. Re. 30,857, Cl. 30-43.500.

Wilson, Katherine W.: *See*—
Swidler, Ronald; and Wilson, Katherine W., Re. 30,860, Cl. 8-116.400.

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# LIST OF DESIGN PATENTEES

American District Telegraph Company: *See*—
Guscott, John K.; and Zaccai, Gianfranco D., 262,869, Cl. D10-106.000.

Ansel, Pierre, to SEB. Cottage cheese making appliance. 262,857, 2-2-82, Cl. D7-96.000.

Armstrong, John C.: *See*—
Paison, Richard C.; and Armstrong, John C., 262,906, Cl. D23-150.000.

Baldwin Piano & Organ Company: *See*—
Kimble, Thomas E., 262,888, Cl. D17-6.000.

Barnsdale, Arthur D. Insert for fixing or fastening purposes. 262,863, 2-2-82, Cl. D8-385.000.

Baruffa, Olindo, to Mefina S.A. Ironing press. 262,885, 2-2-82, Cl. D32-9.000.

Becker, Robert W.; and Bradshaw, Keith L. Articulated vehicle or the like. 262,903, 2-2-82, Cl. D21-135.000.

Beranek, Ernst, to Eduard Frieb Gesellschaft m.b.H. Handle for a brush. 262,840, 2-2-82, Cl. D4-35.000.

Boyer, David C.: *See*—
Schavilje, John N.; and Boyer, David C., 262,864, Cl. D8-385.000.

Bradshaw, Keith L.: *See*—
Becker, Robert W.; and Bradshaw, Keith L., 262,903, Cl. D21-135.000.

Bruce Plastics, Inc.: *See*—
Szabo, Bela G., 262,895, Cl. D20-27.000.

Buffington, James R. Clothes pocket straightener. 262,837, 2-2-82, Cl. D2-378.000.

Carbajales Santa Eulalia, Javier B.: *See*—
Carbajales Santa Eulalia, Jesus A.; and Carbajales Santa Eulalia, Javier B., 262,870, Cl. D11-158.000.

Carbajales Santa Eulalia, Jesus A.; and Carbajales Santa Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a beaver. 262,870, 2-2-82, Cl. D11-158.000.

Chaiken, Mary E. Dual desk unit. 262,846, 2-2-82, Cl. D6-157.000.

Chamberlain, Edward; Leon, Nicholas M.; and Sharp, Michael H., to International Business Machines Corporation. Video data display terminal. 262,878, 2-2-82, Cl. D14-113.000.

Coca-Cola Company, The: *See*—
Fessler, Herman S., 262,884, Cl. D15-7.000.

Commisso, Nicholas D., to Mobil Oil Corporation. Packaging for food container or the like. 262,866, 2-2-82, Cl. D9-347.000.

Cornelius Company, The: *See*—
Fessler, Herman S., 262,884, Cl. D15-7.000.

Dabbs, Allen D. Shuffle pool table game board. 262,896, 2-2-82, Cl. D21-7.000.

Daenen, Robert H. C. M.; and De Coster, Pieter K. J., to Dart Industries Inc. Storage box or the like. 262,839, 2-2-82, Cl. D3-74.000.

Dart Industries Inc.: *See*—
Daenen, Robert H. C. M.; and De Coster, Pieter K. J., 262,839, Cl. D3-74.000.

De Coster, Pieter K. J.: *See*—
Daenen, Robert H. C. M.; and De Coster, Pieter K. J., 262,839, Cl. D3-74.000.

Dietz, Henry G. Bathing suit. 262,835, 2-2-82, Cl. D2-42.000.

Dietz, Henry G. Bathing suit. 262,836, 2-2-82, Cl. D2-42.000.

Dowse, Bruce, to Dowse Designs Pty Limited. Cabinet. 262,848, 2-2-82, Cl. D6-167.000.

Dowse Designs Pty Limited: *See*—
Dowse, Bruce, 262,848, Cl. D6-167.000.

Droll Yankees, Inc.: *See*—
Kilham, Peter, 262,917, Cl. D30-14.000.

Duarte, Gabriel H. Toy castle. 262,902, 2-2-82, Cl. D21-114.000.

Eduard Frieb Gesellschaft m.b.H.: *See*—
Beranek, Ernst, 262,840, Cl. D4-35.000.

Fabriques Reunies de Lampes Electriques: *See*—
Lecordier, Jean, 262,865, Cl. D9-345.000.

Fessler, Herman S., to Coca-Cola Company, The; and Cornelius Company, The. Fluid pump or similar article. 262,884, 2-2-82, Cl. D15-7.000.

Fiat Veicoli Industriali S.p.A.: *See*—
Magrini, Guido, 262,872, Cl. D12-99.000.

Franchi, Aldo; Tessarollo, Severino; and Pesenti, Luigi, to International Standard Electric Corporation. Telephone answering device. 262,875, 2-2-82, Cl. D14-4.000.

Fujitsu Limited: *See*—
Goodin, John W.; Grambush, Douglas H.; Halsted, Milton J.; and Kumagai, Katsuo, 262,882, Cl. D14-103.000.

Gitkin, Merrill J., to Jencraft Corporation. Woven window blind. 262,851, 2-2-82, Cl. D6-205.000.

Glass, Henry P., to Westerlo House, Inc. Candle holder. 262,913, 2-2-82, Cl. D26-13.000.

Goettner, Michael K.; and Plummer, James E., to Owens-Illinois, Inc. Combined bottle and stopper. 262,867, 2-2-82, Cl. D9-378.000.

Goldeen, Donald D. Gameboard. 262,897, 2-2-82, Cl. D21-33.000.

Goodin, John W.; Grambush, Douglas H.; Halsted, Milton J.; and Kumagai, Katsuo, to Fujitsu Limited. Computer control terminal. 262,882, 2-2-82, Cl. D14-103.000.

Goodyear Tire & Rubber Company, The: *See*—
Mendiola, Joseph V.; Jansen, Lawrence G.; and Norton, Robert B., 262,874, Cl. D12-141.000.

Grambush, Douglas H.: *See*—
Goodin, John W.; Grambush, Douglas H.; Halsted, Milton J.; and Kumagai, Katsuo, 262,882, Cl. D14-103.000.

Grethey, Albert K.: *See*—
Moore, Walter E.; and Grethey, Albert K., 262,894, Cl. D20-4.000.

Guscott, John K.; and Zaccai, Gianfranco D., to American District Telegraph Company. Infrared intrusion detector. 262,869, 2-2-82, Cl. D10-106.000.

Haller, John L. Rectangular curved slide spa. 262,909, 2-2-82, Cl. D24-38.000.

Halsted, Milton J.: *See*—
Goodin, John W.; Grambush, Douglas H.; Halsted, Milton J.; and Kumagai, Katsuo, 262,882, Cl. D14-103.000.

Hayden, M. Dean, Jr. Jacket-type coaster. 262,853, 2-2-82, Cl. D7-45.000.

Hayden, M. Dean, Jr. Jacket-type coaster. 262,854, 2-2-82, Cl. D7-45.000.

Heiko, Burton S. Mathematical aid. 262,892, 2-2-82, Cl. D19-64.000.

Hodges, Marvin P. Viewing screen and supporting structure. 262,881, 2-2-82, Cl. D14-84.000.

Ichikawa, Shinpei, to Texas Instruments Incorporated. Case for printing calculator or the like. 262,890, 2-2-82, Cl. D18-7.000.

Igloo Corporation: *See*—
MacTavish, James A.; and McGowan, Ronald C., 262,856, Cl. D7-77.000.

Illinois Tool Works Inc.: *See*—
Schavilje, John N.; and Boyer, David C., 262,864, Cl. D8-385.000.

International Business Machines Corporation: *See*—
Chamberlain, Edward; Leon, Nicholas M.; and Sharp, Michael H., 262,878, Cl. D14-113.000.

International Standard Electric Corporation: *See*—
Franchi, Aldo; Tessarollo, Severino; and Pesenti, Luigi, 262,875, Cl. D14-4.000.
Jansen, Lawrence G.: *See*—
Mendiola, Joseph V.; Jansen, Lawrence G.; and Norton, Robert B., 262,874, Cl. D12-141.000.
Jencraft Corporation: *See*—
Gitkin, Merrill J., 262,851, Cl. D6-205.000.
John J. Madison Company, Inc.: *See*—
Carbajales Santa Eulalia, Jesus A.; and Carbajales Santa Eulalia, Javier B., 262,870, Cl. D11-158.000.
Keller, Huey T., to Vaughan Furniture Company, Inc. Party table. 262,845, 2-2-82, Cl. D6-146.000.
Keller, Huey T., to Vaughan Furniture Company, Inc. Credenza. 262,847, 2-2-82, Cl. D6-159.000.
Kendall Company, The: *See*—
Steigerwald, Carl J.; and Layton, Terry N., 262,910, Cl. D24-51.000.
Kilham, Peter, to Droll Yankees, Inc. Bird feeder. 262,917, 2-2-82, Cl. D30-14.000.
Kimble, Thomas E., to Baldwin Piano & Organ Company. Organ. 262,888, 2-2-82, Cl. D17-6.000.
Koshino, Shinji, to Nihon Seimitsu Sokki Co., Ltd. Pulse counter, or similar article. 262,907, 2-2-82, Cl. D24-17.000.
Kristofek, Paul J., to McGraw-Edison Company. Lens for luminaire. 262,914, 2-2-82, Cl. D26-135.000.
Kroll, Frederick H. Toy writing slate. 262,899, 2-2-82, Cl. D21-59.000.
Kumagai, Katsuo: *See*—
Goodin, John W.; Grambush, Douglas H.; Halsted, Milton J.; and Kumagai, Katsuo, 262,882, Cl. D14-103.000.
Layton, Terry N.: *See*—
Steigerwald, Carl J.; and Layton, Terry N., 262,910, Cl. D24-51.000.
Lecordier, Jean, to Fabriques Reunies de Lampes Electriques. Packaging form for electric lamps. 262,865, 2-2-82, Cl. D9-345.000.
Lee, Sonny J. S. Fireplace grate. 262,861, 2-2-82, Cl. D7-207.000.
Leon, Nicholas M.: *See*—
Chamberlain, Edward; Leon, Nicholas M.; and Sharp, Michael H., 262,878, Cl. D14-113.000.
Les Industries Provinciales LTEE: *See*—
Morin, Andre, 262,855, Cl. D7-59.000.
Loiseau, Bernard, to SEB. Domestic appliance for grating, slivering and slicing. 262,860, 2-2-82, Cl. D7-153.000.
Lonardo, Frank. Dice game board. 262,898, 2-2-82, Cl. D21-41.000.
Lytle, Charlotte E. Glue gun holder. 262,862, 2-2-82, Cl. D8-71.000.
MacTavish, James A.; and McGowan, Ronald C., to Igloo Corporation. Insulated jug. 262,856, 2-2-82, Cl. D7-77.000.
Magrini, Guido, to Fiat Veicoli Industriali S.p.A. Van. 262,872, 2-2-82, Cl. D12-99.000.
Manufacture Metallurgique de Tournus: *See*—
Martin, Francois, 262,858, Cl. D7-107.000.
Markwood, Carl C.; and Markwood, Marie K. Combined self-contained water reservoir and golf club scrub brush or similar article. 262,904, 2-2-82, Cl. D21-234.000.
Markwood, Marie K.: *See*—
Markwood, Carl C.; and Markwood, Marie K., 262,904, Cl. D21-234.000.
Marshall, Eric J. Telephone. 262,879, 2-2-82, Cl. D14-53.000.
Martin, Francois, to Manufacture Metallurgique de Tournus. Hanging gas cooker for campers. 262,858, 2-2-82, Cl. D7-107.000.
Martin, Robert A., to Metcor Manufacturing. Desk accessory receptacle. 262,893, 2-2-82, Cl. D19-92.000.
Matsui, Hidetoshi. Kinetic sculpture. 262,900, 2-2-82, Cl. D21-102.000.
McGowan, Ronald C.: *See*—
MacTavish, James A.; and McGowan, Ronald C., 262,856, Cl. D7-77.000.
McGraw-Edison Company: *See*—
Kristofek, Paul J., 262,914, Cl. D26-135.000.
Mefina S.A.: *See*—
Baruffa, Olindo, 262,885, Cl. D32-9.000.
Mendiola, Joseph V.; Jansen, Lawrence G.; and Norton, Robert B., to Goodyear Tire & Rubber Company, The. Tire. 262,874, 2-2-82, Cl. D12-141.000.
Metcor Manufacturing: *See*—
Martin, Robert A., 262,893, Cl. D19-92.000.
Miller, John F. Three wheel trolley. 262,919, 2-2-82, Cl. D34-35.000.
Mobil Oil Corporation: *See*—
Commisso, Nicholas D., 262,866, Cl. D9-347.000.
Moore, Walter E.; and Grethey, Albert K., to UMC Industries, Inc. Vending machine cabinet. 262,894, 2-2-82, Cl. D20-4.000.
Morey, Clinton H. Holder for towel or the like. 262,842, 2-2-82, Cl. D6-102.000.
Morin, Andre, to Les Industries Provinciales LTEE. Cruet for vinegar, oil or the like. 262,855, 2-2-82, Cl. D7-59.000.
Nast, Richard. Transparent storage envelope for flexible, magnetic computer discs. 262,891, 2-2-82, Cl. D19-33.000.
Nihon Seimitsu Sokki Co., Ltd.: *See*—
Koshino, Shinji, 262,907, Cl. D24-17.000.
Norton, Robert B.: *See*—
Mendiola, Joseph V.; Jansen, Lawrence G.; and Norton, Robert B., 262,874, Cl. D12-141.000.
Okajima, Shinpei, to Shimano Industrial Company, Limited. Pedal for bicycles. 262,873, 2-2-82, Cl. D12-125.000.
Owens-Illinois, Inc.: *See*—
Goettner, Michael K.; and Plummer, James E., 262,867, Cl. D9-378.000.
Palson, Richard C.; and Armstrong, John C., to Pharmasol Corporation, The. Room dedorant dispenser. 262,906, 2-2-82, Cl. D23-150.000.
Perkins, Jeffrey M. Support rack for a western saddle or the like. 262,918, 2-2-82, Cl. D30-45.000.
Pesco, Manny N. Hand-held body massager. 262,908, 2-2-82, Cl. D24-36.000.
Pesenti, Luigi: *See*—
Franchi, Aldo; Tessarollo, Severino; and Pesenti, Luigi, 262,875, Cl. D14-4.000.
Pharmasol Corporation, The: *See*—
Palson, Richard C.; and Armstrong, John C., 262,906, Cl. D23-150.000.
Phillips, Maurice L. Storage rack for a holstered handgun. 262,843, 2-2-82, Cl. D6-114.000.
Pittway Corporation: *See*—
Westphal, Donald J., 262,868, Cl. D10-106.000.
Plummer, James E.: *See*—
Goettner, Michael K.; and Plummer, James E., 262,867, Cl. D9-378.000.
Pondunavac, Bozo. Guitar. 262,889, 2-2-82, Cl. D17-19.000.
Powell, John W., III. Manual full web stretch-wrap pallet wrapper. 262,887, 2-2-82, Cl. D15-145.000.
Powers, Ronald H. Automobile. 262,871, 2-2-82, Cl. D12-85.000.
Price, George W. E. Head and neck rest. 262,850, 2-2-82, Cl. D6-200.000.
Produtos Eletricos Corona Ltda.: *See*—
Tommaso, Helio, 262,905, Cl. D23-35.000.
Rader, Gladys C. Button spacer. 262,838, 2-2-82, Cl. D3-18.000.
Recognition Equipment Incorporated: *See*—
Sanner, Medford D., 262,883, Cl. D14-116.000.
Richardson, Breck J. Cabinet bar. 262,844, 2-2-82, Cl. D6-144.000.
Russell, James E., to Universal Food Fork Corporation. Food fork. 262,859, 2-2-82, Cl. D7-151.000.
Ryosei Co., Ltd.: *See*—
Yoshimura, Tadashi, 262,886, Cl. D34-21.000.
Sanner, Medford D., to Recognition Equipment Incorporated. Hand held reader. 262,883, 2-2-82, Cl. D14-116.000.
Schavilje, John N.; and Boyer, David C., to Illinois Tool Works Inc. Screw anchor. 262,864, 2-2-82, Cl. D8-385.000.
Schoenig, Darrell A. Adjustable table. 262,849, 2-2-82, Cl. D6-178.000.
SEB: *See*—
Ansel, Pierre, 262,857, Cl. D7-96.000.
Loiseau, Bernard, 262,860, Cl. D7-153.000.
Shames, Harold: *See*—
Shames, Sidney J.; and Shames, Harold, 262,841, Cl. D6-92.000.
Shames, Sidney J.; and Shames, Harold. Bathroom accessory support for attachment to a frame. 262,841, 2-2-82, Cl. D6-92.000.
Sharp, Michael H.: *See*—
Chamberlain, Edward; Leon, Nicholas M.; and Sharp, Michael H., 262,878, Cl. D14-113.000.
Shimano Industrial Company, Limited: *See*—
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Steigerwald, Carl J.; and Layton, Terry N., to Kendall Company, The. Midstream collection housing. 262,910, 2-2-82, Cl. D24-51.000.
Szabo, Bela G., to Bruce Plastics, Inc. Luggage tag. 262,895, 2-2-82, Cl. D20-27.000.
TDK Electronics Co., Ltd.: *See*—
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Yoshizawa, Keiichi, 262,877, Cl. D14-11.000.
Tessarollo, Severino: *See*—
Franchi, Aldo; Tessarollo, Severino; and Pesenti, Luigi, 262,875, Cl. D14-4.000.
Texas Instruments Incorporated: *See*—
Ichikawa, Shinpei, 262,890, Cl. D18-7.000.
Therien, Charles: *See*—
Therien, Yvon; Therien, Rene; and Therien, Charles, 262,912, Cl. D25-23.000.
Therien, Rene: *See*—
Therien, Yvon; Therien, Rene; and Therien, Charles, 262,912, Cl. D25-23.000.
Therien, Yvon; Therien, Rene; and Therien, Charles. Mobile kiosk. 262,912, 2-2-82, Cl. D25-23.000.
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Tommaso, Helio, to Produtos Eletricos Corona Ltda. Electrically heated shower head. 262,905, 2-2-82, Cl. D23-35.000.
UMC Industries, Inc.: *See*—
Moore, Walter E.; and Grethey, Albert K., 262,894, Cl. D20-4.000.
U.S. Philips Corporation: *See*—
van de Ven, Peter H. J., 262,880, Cl. D14-73.000.
Universal Food Fork Corporation: *See*—
Russell, James E., 262,859, Cl. D7-151.000.
van de Ven, Peter H. J., to U.S. Philips Corporation. Clock radio. 262,880, 2-2-82, Cl. D14-73.000.
Vaughan Furniture Company, Inc.: *See*—
Keller, Huey T., 262,845, Cl. D6-146.000.
Keller, Huey T., 262,847, Cl. D6-159.000.

Vukadinovic, Dragan. Puzzle or similar article. 262,901, 2-2-82, Cl. D21-107.000.
Wallenwein, Hans K. Hanger for carpet displays. 262,852, 2-2-82, Cl. D6-252.000.
Weddell, Lloyd A. Leg rest. 262,911, 2-2-82, Cl. D24-64.000.
Westerlo House, Inc.: *See*—
Glass, Henry P., 262,913, Cl. D26-13.000.
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Yoshizawa, Keiichi, to TDK Electronics Co., Ltd. Casette tape. 262,876, 2-2-82, Cl. D14-11.000.
Yoshizawa, Keiichi, to TDK Electronics Co., Ltd. Casette tape. 262,877, 2-2-82, Cl. D14-11.000.
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Guscott, John K.; and Zaccai, Gianfranco D., 262,869, Cl. D10-106.000.

# LIST OF PLANT PATENTEES

Columbia & Okanogan Nursery, Inc.: *See*—
Harvey, Richard A., 4,820, Cl. 34.000.
Ecke, Paul, Jr., to Paul Ecke Ranch. Poinsettia named V-10 Pink. 4,821, 2-2-82, Cl. 86.000.
Green, Lester, to Wells & Wade Fruit Co., Inc. Early coloring spur-type red delicious apple tree. 4,819, 2-2-82, Cl. 35.000.
Harvey, Richard A., to Columbia & Okanogan Nursery, Inc. Apple tree. 4,820, 2-2-82, Cl. 34.000.
Paul Ecke Ranch: *See*—
Ecke, Paul, Jr., 4,821, Cl. 86.000.
Wells & Wade Fruit Co., Inc.: *See*—
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# LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 2ND DAY OF FEBRUARY, 1982

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Robinson, James D. Light-weight base for a bed. T101,501, 2-2-82, Cl. 5-186.00R.

# CLASSIFICATION OF PATENTS

## ISSUED FEBRUARY 2, 1982

NOTE.—First number, class; second number, subclass; third number, patent number

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174 4,314,175
185 4,314,176
497 4,314,177
4,314,178

**CLASS 315**

12 ND 4,314,179
289 4,314,181
307 4,314,182
389 4,314,183
408 4,314,184

**CLASS 318**

85 4,314,185
434 4,314,186
611 4,314,187
721 4,314,188
732 4,314,189
798 4,314,190
802 4,314,191

**CLASS 322**

2 R 4,314,192
28 4,314,193
89 4,314,194
90 4,314,195

**CLASS 323**

315 4,314,196
324 4,314,197
351 4,314,198

**CLASS 324**

52 4,314,199
117 R 4,314,200
127 4,314,201
207 4,314,202
262 4,314,203
316 4,314,204
460 4,314,205

**CLASS 329**

50 4,314,206

**CLASS 330**

110 4,314,207

**CLASS 331**

1 A 4,314,208
3 4,314,209

**CLASS 333**

20 4,314,212
141 4,314,214
182 4,314,213
193 4,314,215
198 4,314,216

**CLASS 335**

188 4,314,217
210 4,314,218
295 4,314,219

**CLASS 336**

65 4,314,220
83 4,314,221

**CLASS 337**

107 4,314,222
113 4,314,223
408 4,314,224

**CLASS 338**

4 4,314,225
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14 4,314,228
99 4,314,227
160 4,314,229
314 4,314,230
328 4,314,231

**CLASS 339**

103 M 4,313,645
156 R 4,313,646

**CLASS 340**

52 F 4,314,232
347 AD 4,314,235
384 E 4,314,236
502 4,314,237
525 4,314,238
556 4,314,239
573 4,314,240
603 4,314,241
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812 4,314,245
825.02 4,314,233
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**CLASS 343**

6 R 4,314,246
6.5 LC 4,314,247
18 D 4,314,249
18 E 4,314,248
100 SA 4,314,250
112 R 4,314,251
113 R 4,314,252
765 4,314,253
809 4,314,254
909 4,314,255

**CLASS 346**

1.1 4,314,256
74.4 4,314,257
75 4,314,258
4,314,259
76 L 4,314,260
108 4,314,261
135.1 4,314,262
140 R 4,314,263
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**CLASS 350**

164 4,313,647
166 4,313,648
252 4,313,649
263 4,313,650
355 4,313,651

**CLASS 351**

106 4,313,652

**CLASS 352**

91 C 4,313,653

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25 4,313,654
4,313,655
29 4,313,656
53 4,313,657
152 4,313,658
234 4,313,659
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271 4,313,663
288 4,313,664
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3 R 4,313,670
14 D 4,313,671
14 R 4,313,672
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**CLASS 356**

2 4,313,678
244 4,313,679

**CLASS 357**

23 4,314,265
38 4,314,266
43 4,314,267
48 4,314,268
51 4,314,269
75 4,314,270
76 4,314,271

**CLASS 358**

10 4,314,272
11 4,314,273
80 4,314,274
113 4,314,275
125 4,314,276
167 4,314,277
210 4,314,278
212 4,314,279
255 4,314,280
280 4,314,281
286 4,314,282
294 4,314,283

**CLASS 360**

10 4,314,284
33 4,314,285
40 4,314,286
51 4,314,287
65 4,314,288
77 4,314,289
4,314,290
78 4,314,291
86 4,314,292
92 4,314,293
96.6 4,314,294
106 4,314,295
109 4,314,296
113 4,314,297
121 4,314,298
130.33 4,314,299

**CLASS 361**

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65 4,314,301
119 4,314,302
120 4,314,303
124 4,314,304
154 4,314,305
182 4,314,306
194 4,314,307
212 4,314,308
331 4,314,309
4,314,310
386 4,314,311
400 4,314,312
433 4,314,313

**CLASS 362**

32 4,314,314
80 4,314,315
86 4,314,316
189 4,314,317
240 4,314,318
287 4,314,319
342 4,314,320

**CLASS 363**

10 4,314,321
46 4,314,322
71 4,314,323
90 4,314,324
98 4,314,325
127 4,314,326
142 4,314,327

**CLASS 364**

141 4,314,329
192 4,314,330
200 4,314,331
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411 4,314,336
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424.1 4,314,340
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**CLASS 365**

19 4,314,358
179 4,314,359
203 4,314,360
221 4,314,361
227 4,314,362

**CLASS 366**

337 4,313,680

**CLASS 367**

16 4,314,363
43 4,314,364
82 4,314,365

**CLASS 369**

35 4,314,366

**CLASS 370**

60 4,314,367
108 4,314,368

**CLASS 371**

69 4,314,369

**CLASS 372**

18 4,314,210
32 4,314,211

**CLASS 375**

28 4,314,370
58 4,314,371

**CLASS 376**

130 4,314,180
247 4,313,792
252 4,313,791
260 4,313,793
280 4,313,795
352 4,313,794
353 4,313,796
441 4,313,797

**CLASS 400**

144.2 4,313,681
144.3 4,313,682
225 4,313,683
322 4,313,684
479 4,313,685

**CLASS 401**

127 4,313,686

**CLASS 403**

171 4,313,687
189 4,313,688

**CLASS 404**

73 4,313,689
114 4,313,690
117 4,313,691

**CLASS 405**

43 4,313,692
121 4,313,693
168 4,313,694
259 4,313,695
4,313,696
261 4,313,697
296 4,313,698

**CLASS 406**

93 4,313,699
156 4,313,700

**CLASS 410**

52 4,313,701
94 4,313,702

**CLASS 414**

115 4,313,703
199 4,313,704
312 4,313,705
326 4,313,706
409 4,313,707
498 4,313,708
684.3 4,313,709

**CLASS 415**

2 R 4,313,710
7 4,313,711

**CLASS 416**

2 4,313,712
135 4,313,713

**CLASS 417**

273 4,313,714
312 4,313,715
331 4,313,716

**CLASS 418**

48 4,313,717

**CLASS 422**

69 4,313,906
97 4,313,907
111 4,313,908
133 4,313,909
147 4,313,910
159 4,313,911
267 4,313,912

**CLASS 423**

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82 4,313,913
167 4,313,915
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228 4,313,917
242 4,313,924
263 4,313,925
310 4,313,918
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449 4,313,920
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578 R 4,313,922
628 4,313,923

**CLASS 424**

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1.5 4,313,928
12 4,313,929
32 4,313,930
45 4,313,931
62 4,313,932
72 4,313,933
85 4,313,934
115 4,313,935
117 4,313,936
177 4,313,937
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273 R 4,313,948
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**CLASS 425**

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335 4,313,719
526 4,313,720

**CLASS 426**

17 4,313,960
19 4,313,961
35 4,313,962
58 4,313,963
138 4,313,964
139 4,313,965
250 4,313,966
327 4,313,967

**CLASS 427**

27 4,313,968
44 4,313,969
56.1 4,313,970
84 4,313,971
113 4,313,972
205 4,313,973
209 4,313,974
236 4,313,975
297 4,313,976
342 4,313,977
384 4,313,978
387 4,313,979
402 4,313,980
405 4,313,981
428 4,313,982
435 4,313,983

**CLASS 428**

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31 4,313,985
40 4,313,986
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64 4,313,989
85 4,313,990
131 4,313,991
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**CLASS 429**

8 4,314,008
161 4,314,009
191 4,314,010

**CLASS 430**

17 4,314,011
31 4,314,012
37 4,314,013
57 4,314,014
58 4,314,015
59 4,314,016
109 4,314,017
125 4,314,018
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270 4,314,021
326 4,314,022
389 4,314,023
564 4,314,024

**CLASS 431**

265 4,313,721

**CLASS 432**

1 4,313,722
37 4,313,723
217 4,313,724

**CLASS 433**

126 4,313,725

**CLASS 434**

42 4,313,726
174 4,313,727

**CLASS 435**

2 4,314,025
7 4,314,026
34 4,314,027
77 4,314,028
291 4,314,029
296 4,314,030

**CLASS 455**

68 4,314,372
73 4,314,373
108 4,314,374
158 4,314,375
212 4,314,376
223 4,314,377
291 4,314,378

**CLASS 474**

14 4,313,728
135 4,313,729
201 4,313,730

**CLASS 501**

44 4,314,031

**CLASS 521**

52 4,314,032
65 4,314,033
4,314,034
77 4,314,035
99 4,314,036
125 4,314,037
167 4,314,038

**CLASS 525**

1 4,314,039
6 4,314,040
53 4,314,041
59 4,314,042
102 4,314,043

**CLASS 526**

93 4,314,045
125 4,314,046

**CLASS 528**

26 4,314,047
44 4,314,048
128 4,314,049
140 4,314,050
179 4,314,051
287 4,314,052
483 4,314,053

**CLASS 536**

17 A 4,314,054
53 4,314,055
63 4,314,056

**CLASS 542**

401 4,314,057
455 4,314,058

**CLASS 544**

27 4,314,059
80 4,314,061
171 4,314,060
402 4,314,062

**CLASS 546**

298 4,314,063
317 4,314,064

**CLASS 548**

222 4,314,065
320 4,314,066
4,314,067

**CLASS 556**

440 4,314,068

**CLASS 560**

62 4,314,069
64 4,314,070
127 4,314,071
231 4,314,072

**CLASS 562**

416 4,314,073
535 4,314,074
599 4,314,075

**CLASS 564**

33 4,314,076
70 4,314,077
99 4,314,078
220 4,314,079
224 4,314,080
347 4,314,081
381 4,314,082
479 4,314,083
480 4,314,084

**CLASS 568**

644 4,314,085
652 4,314,086
842 4,314,087
860 4,314,088
949 4,314,089

**CLASS 585**

328 4,314,090
486 4,314,091

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378 262,837
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D4— 35 262,840
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144 262,844
146 262,845
157 262,846
159 262,847
167 262,848
178 262,849
200 262,850
205 262,851
252 262,852
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96 262,857
107 262,858
151 262,859
153 262,860
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103 262,882
113 262,878
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